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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

Jan. 28, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

3,189,984, Franklin Electric Co., Inc., LAMINATED CORE BANDING APPARATUS, **filed** June 27, 1979, D.C., S.D. Ohio (Dayton), Doc. C-3-79-243, *Lee J. Lakes & Franklin Electric Co., Inc.* v. *Machine Products Corporation.* Complaint and counterclaim dismissed on Feb. 8, 1980.

3,324,869, Henry J. Duda, AWNINGS FOR TRAVEL TRAILERS AND/OR MOBILE HOMES, **filed** Feb. 12, 1980, D.C., N.D. Tex. (Dallas), Doc. CA3-80-0173-R, *Henry J. Duda* v. *Texas Trimline, Inc.*

3,416,984, Sealed Air Corporation, METHOD AND APPARATUS FOR MAKING CELLULAR MATERIAL FROM THERMOPLASTIC SHEETS, **filed** Feb. 11, 1980, D.C., S.D.N.Y., Doc. 80-C-828 TPG, *Sealed Air Corporation* v. *Bubble Protek, Inc.*

3,504,762, Stewart-Warner Corporation, DISPLAY SYSTEM; **3,941,926,** same, VARIABLE INTENSITY DISPLAY DEVICE; **4,009,335,** same, GRAY SCALE DISPLAY SYSTEM EMPLOYING DIGITAL ENCODING; **4,148,073,** same, HIGH SPEED VIDEO DISPLAY SYSTEM INCLUDING ZOOM FEATURE, **filed** Oct. 26, 1979, D.C., W.D. Wash. (Seattle), Doc. C-79-1264M, *American Sign & Indicator Corp.* v. *Stewart-Warner Corp.* Plaintiff filed voluntary dismissal of action on Dec. 17, 1979.

3,724,789, Stephen L. Snyder, RAM AIR GLIDE PARACHUTE, **filed** Nov. 30, 1979, D.C. Md. (Baltimore), Doc. B-79-2225, *Stephen L. Snyder* v. *Mike Mount.* Defendant is permanently enjoined from infringing plaintiff's patent. Filed Mar. 17, 1980.

3,754,360, Kennametal Inc., CUTTING INSERT AND CLAMPING ARRANGEMENT THEREFOR, **filed** Feb. 8, 1980, D.C., W.D. Mich. (Grand Rapids), Doc. G80-91 CA1, *Kennametal Inc.* v. *Spec Tool Company, Inc.*

3,758,151, Dual Manufacturing & Engineering, Inc., RECLINING CHAIR; **3,874,724,** same; **Re. 28,210,** same; **Re. 29,483,** same, **filed** Oct. 20, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c4153, *Dual Manufacturing & Engineering, Inc.* v. *Futorian Corporation.*

3,781,859, Albert Hermans, CONTROLLED WAVE PATTERN ULTRASONIC BURGLAR ALARM; **3,846,779,** John Martner, ULTRASONIC TRANSDUCER, **filed** July 7, 1977, D.C., N.D. Calif. (San Francisco), Doc. C-77-1477, *Galloway et al.* v. *Hermans et al.* Judgment entitling patent containing count at issue to be issued to defendant and also affirming decision of Board of Patent Interferences in favor of defendant and against plaintiffs filed June 27, 1978.

3,846,779. (See 3,781,859.)

3,874,724. (See 3,758,151.)

3,905,599 Martin Mazman, VARIABLE RESISTANCE EXERCISING DEVICE, **filed** Feb. 25, 1980, D.C. Md. (Baltimore), Doc. JH-80-446, *Universal Gym Equipment, Inc. et al.* v. *Atlantic Health and Fitness Products et al.*

3,941,926. (See 3,504,762.)

3,948,556, Strolee of California, CHILD'S CAR SEAT, **filed** Feb. 7, 1980, D.C., E.D. Mo. (St. Louis), Doc. 80-183C(2), *Welsh Company* v. *California Strolee, Inc., doing business as Strolee of California.*

3,951,352, Western Broadcasting Co., MAGNETIC TAPE GUIDANCE DEVICE, **filed** Nov. 2, 1979, D.C., N.D. Calif. (San Francisco), Doc. C-79-3088 CBR, *Western Broadcasting Co.* v. *Capital Records, Inc. et al.*

3,973,806, James R. Musselman, ICE STUD FOR SNOWMOBILE TRACKS; **D. 238,764,** Janssen et al., same, **filed** Feb. 13, 1980, D.C., W.D. Mich. (Grand Rapids), Doc. G80-95 CA1, *Kalamazoo Engineering Co.* v. *James R. Musselman, doing business as International Engineering Co.* Same, **filed** Mar. 6, 1980, D.C., E.D. Mich. (Detroit), Doc. 80-70971, *James R. Musselman, doing business as International Engineering Co.* v. *Marshall Distributing Inc. et al.*

3,979,525, Multi-National Investment Corp., PROCESS FOR RETARDING MOLD GROWTH IN PARTIALLY BAKED PIZZA CRUSTS AND ARTICLES PRODUCED THEREBY; **4,079,666,** same, APPARATUS FOR TREATING BAKED PRODUCTS IN ORDER TO IMPROVE THE SHELF LIFE THEREOF, **filed** Aug. 8, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3272, *Multi-National Investment Corp.* v. *Keebler Company, Inc. et al.* Cause dismissed without prejudice per order dated Feb. 26, 1980.

4,000,335. (See 3,504,762.)

4,020,649, Henry Grossbard, BRILLIANTIZED STEP CUT DIAMOND, **filed** Feb. 6, 1980, D.C., S.D.N.Y., Doc. 80-C-0744, *Radiant Cut Diamond Corp.* v. *Universal Mines Inc.*

4,027,624, Freund Industrial Co., Ltd., FLUID GRANULATING/COATING APPARATUS UTILIZING SUCTION AIR CURRENT, **filed** Jan. 4, 1980, D.C. District of Columbia (Wash. D.C.), Doc. 80-0023, *Glatt Air Techniques, Inc.* v. *Freund Industrial Co., Ltd.*

4,079,666. (See 3,979,525.)

4,114,294, Melvin Marmer, ARITHMETIC TEACHING DEVICE, **filed** Nov. 15, 1979, D.C., S.D. Fla. (Miami), Doc. 79-6629-CIV-ALH, *Melvin Marmer* v. *Jefferson Stores, Inc. et al.*

4,133,304, EMDE Corporation, SYRINGE LIKE APPARATUS WITH REMOVABLE CAPILLARY CARTRIDGE, **filed** Jan. 15, 1980, D.C. Colo. (Denver), Doc. 80-K-61, *Marquest Medical Products, Inc.* v. *EMDE Corporation.*

4,144,690, Aluma Building Systems Incorporated, CONCRETE FORMING STRUCTURES; **4,156,999,** same, BEAM FOR CONCRETE FORMING STRUCTURES, **filed** Mar. 10, 1980, D.C. Conn. (Bridgeport), Doc. B-80-138, *Aluma Systems Incorporated* v. *Structural Contours, Inc.*

4,148,073. (See 3,504,762.)

4,153,163, Alderman and Morris, ENVELOPE AND FORM ASSEMBLY, **filed** Feb. 8, 1980, D.C. Ariz. (Phoenix), Doc. C-80-92-PHX, *Moore Business Forms, Inc.* v. *Norman H. Alderman et al.*

4,153,469, Vladimer I. Alexandrov et al., MONOCRYSTALS BASED ON STABILIZED ZIRCONIUM OR HAFNIUM DIOXIDE AND METHOD OF PRODUCTION THEREOF; **filed** Feb. 28, 1980, D.C., S.D.N.Y., Doc. 80-C-1165 RLC, *Clayhill Resources Ltd.* v. *MSB Industries Inc.* Same, **filed** Feb. 28, 1980, D.C., S.D.N.Y., Doc. 80-C-1166 RLC, *Clayhill Resources Ltd.* v. *Yagba Gems, Inc.* Same, **filed** Feb. 29, 1980, D.C.N.J. (Newark), Doc. 80-570, *Clayhill Resources, Ltd.* v. *Singh Industries et al.*

4,156,999. (See 4,144,690.)

4,157,295, Delbert I. Liller, METHOD AND APPARATUS FOR TESTING AND SEPARATING MINERALS; **4,159,073,** same, METHOD OF MANUFACTURING AND INSTALLING AN INLET LINE DEFLECTOR IN A CENTRIFUGAL CYCLONE FOR WASHING COAL; **4,164,467,** same, A COAL WASHING PLANT EMPLOYING A FEED EQUALIZER AND A CRITICALLY DIMENSIONED DEFLECTOR SURFACE IN THE INLET PIPES OF A PLURALITY OF CYCLONES, **filed** Mar. 6, 1980, D.C. Md. (Baltimore), Doc. B–80–543, *Delbert I. Liller* v. *Buffalo Coal Co., Inc.*

4,159,073. (See 4,157,295.)

4,161,335, Nix and Davenport, TRUCK BED LINER; **4,181,349,** same, **filed** Mar. 5, 1980, D.C., S.D. Tex. (Houston), Doc. H–80–481, *Plastics Unlimited, et al.* v. *Fred Davis, doing business as Davis Distributors.*

4,161,440, Airwick Industries, Inc., POWDERED CARPET COMPOSITION, **filed** Jan. 22, 1980, D.C.N.J. (Newark), Doc. 80–186, *Airwick Industries, Inc.* v. *Certified Chemicals, Inc.* Same, **filed** Jan. 22, 1980, D.C.N.J. (Newark), Doc. 80–187, *Airwick Industries, Inc.* v. *Sterling Drug, Inc., doing business as Lehn & Fink Products Group.*

4,164,467. (See 4,157,295.)

4,170,420, Gene E. Underwood, FLUID MIXING SYSTEM, **filed** Mar. 5, 1980, D.C., W.D. Okla. (Oklahoma City), Doc. 80–252–W, *3U Partners et al.* v. *Don E. Gonzales et al.*

4,181,349. (See 4,161,335.)

Re. 28,210. (See 3,758,151.)

Re. 29,483. (See 3,758,151.)

Re. 29,922, Sidney O. Sampson, TRACK SELECTION CONTROL MEANS FOR MAGNETIC SIGNAL RECORDING AND REPRODUCING SYSTEMS, **filed** Aug. 24, 1979, D.C., S.D.N.Y., Doc. 79–C–4491, *Sidney O. Sampson* v. *Sony Corporation of America.*

D. 230,454, Ray N. Thompson, CUSHION, **filed** Feb. 20, 1980, D.C., S.D.N.Y., Doc. 80–C–988 KTD, *Olympic Resources, Inc.* v. *J R Toy Sales Corporation.*

D. 238,764. (See 3,973,808.)

D. 251,821, Harvey Levine, COFFEE SERVER, **filed** Feb. 21, 1980, D.C. Conn. (Bridgeport), Doc. B–80–93, *ACA Products, Inc.* v. *Reuben H. Donnelley Corporation et al.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 250,079, Re. S.N. 091,031, Filed Nov. 5, 1979, Cl. D6/178, WORKBENCH, Ronald Price Hickman, et al., Owner of Record: *Inventors,* Attorney or Agent: Richard G. Berkley, Ex. Gp.: 290

3,460,680, Re. S.N. 120,264, Filed Feb. 11, 1980, Cl. 210/315, FILTER MEDIA SUPPORT WITH FILTER MEDIUM, Keith Raphael Domnick, Owner of Record: *Inventor,* Attorney or Agent: Henry N. Paul, Jr., et al., Ex. Gp.: 176

3,496,258, Re. S.N. 130,654, Filed Mar. 17, 1980, Cl. 264/521, METHOD OF POLYMER MOLDING, Fred E. Wiley, Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 147

3,714,905, Re. S.N. 112,713, Filed Jan. 31, 1980, Cl. 105/197 DB, DAMPENED RAILWAY CAR TRUCK, Franklin D. Barber, Owner of Record: *Standard Car Truck Co., Chicago, Ill.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 316

3,817,881, Re. S.N. 046,980, Filed Oct. 1, 1979, Cl. 260/928, FLAME RETARDANT POLYURETHANE FOAM, Richard J. Turley, Owner of Record: *Olin Corporation, New Haven, Conn.,* Attorney or Agent: F. A. Iskander, et al., Ex. Gp.: 122

3,942,487, Re. S.N. 964,797, Filed Nov. 30, 1978, Cl. 123/41.79, INTERNAL COMBUSTION ENGINE—PREFERABLY OF IN-LINE CONSTRUCTION, ESPECIALLY FOR MOTOR VEHICLES, Anton Zink, Owner of Record: *Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 342

3,983,398, Re. S.N. 118,686, Filed Feb. 5, 1980, Cl. 250/445 T, METHOD AND APPARATUS FOR X-RAY OR GAMMA Y-RAY -3D TOMOGRAPHY USING A FAN BEAM, Douglas P. Boyd, Owner of Record: *Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.,* Attorney or Agent: Paul D. Flehr, Ex. Gp.: 256

4,061,150, Re. S.N. 109,001, Filed Dec. 31, 1979, Cl. 132/7, QUATERNARY AMMONIUM COMPOUNDS IN PRETREATMENT OF HAIR BEFORE SHAMPOOING WITH AN ANIONIC SHAMPOO, George F. Doshe, et al., Owner of Record: *Alberto-Culver Co., Melrose Park, Ill.,* Attorney or Agent: Sidney Wallenstein, et al., Ex. Gp.: 333

4,068,515, Re. S.N. 112,523, Filed Jan. 16, 1980, Cl. 72/115, FLARING TOOL, Leonard J. Kowal, et al., Owner of Record: *Gould Inc., Chicago, Ill.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 321

4,077,006, Re. S.N. 116,192, Filed Jan. 28, 1980, Cl. 455/308, BIDIRECTIONAL UNICABLE SWITCHING SYSTEM, Victor Nicholson, Owner of Record: *Inventor,* Attorney or Agent: James C. Wray, Ex. Gp.: 233

4,078,268, Re. S.N. 121,674, Filed Feb. 15, 1980, Cl. 3/1.5, HEART VALVE PROSTHESIS, Zinon C. Possis, Owner of Record: *St. Jude Medical, Inc., Minneapolis, Minn.,* Attorney or Agent: Warren N. Low, Ex. Gp.: 337

4,105,829, Re. S.N. 104,336, Filed Dec. 17, 1979, Cl. 429/15, METAL HALOGEN BATTERIES AND METHOD OF OPERATING SAME, Agustin F. Venero, Owner of Record: *Exxon Research and Engineering Company, Wilmington, Del.,* Attorney or Agent: Donald F. Wohlers, et al., Ex. Gp.: 114

4,151,732, Re. S.N. 117,779, Filed Feb. 1, 1980, Cl. 72/8, PROCESS AND DEVICE FOR BENDING ELONGATED ARTICLES, Marinus J. Hofstede, et al., Owner of Record: *Cojafex B.V., Rotterdam, The Netherlands,* Attorney or Agent: Karl W. Flocks, Ex. Gp.: 321

4,160,791, Re. S.N. 119,204, Filed Feb. 7, 1980, Cl. 525/469, POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF, Willard S. Higley, et al., Owner of Record: *The United States of America, as represented by The Secretary, Department of Health, Education, and Welfare,* Attorney or Agent: Joseph E. Mueth, et al., Ex. Gp.: 143

PATENT NOTICES

Certificates of Correction for the Week of May 20, 1980

3,915,557	4,166,867	4,182,135	4,186,521
3,967,205	4,169,060	4,182,481	4,186,840
3,985,265	4,169,094	4,182,727	4,187,039
4,013,795	4,169,957	4,183,007	4,187,066
4,063,558	4,171,373	4,183,139	4,187,076
4,067,816	4,171,386	4,183,175	4,187,229
4,090,933	4,171,388	4,183,278	4,187,371
4,112,123	4,172,339	4,183,771	4,187,613
4,123,990	4,173,009	4,183,812	4,187,745
4,126,071	4,175,014	4,184,158	4,187,870
4,127,157	4,175,277	4,184,325	4,187,896
4,130,424	4,176,153	4,184,362	4,188,007
4,135,943	4,177,195	4,184,789	4,188,048
4,139,452	4,177,576	4,185,230	4,188,132
4,142,775	4,177,829	4,185,234	4,188,928
4,145,034	4,178,136	4,185,499	4,189,053
4,146,105	4,179,156	4,185,660	4,189,389
4,151,018	4,180,614	4,185,719	4,189,495
4,153,541	4,180,687	4,185,763	4,190,009
4,155,437	4,181,423	4,186,164	4,190,425
4,155,929	4,181,454	4,186,192	4,191,349
4,156,736	4,181,781	4,186,315	4,191,719
4,157,651	4,181,875	4,186,405	4,191,966

Disclaimer

4,127,245.—*Franklin A. Tefft*, Killingworth, *Don L. Adams*, Fairfield and *Lou S. Cotton*, Monroe, Conn. HELICOPTER PITCH RATE FEEDBACK BIAS FOR PITCH AXIS MANEUVERING STABILITY AND LOAD FEEL. Patent dated Nov. 28, 1978. Disclaimer filed Feb. 4, 1980, by the assignee, *United Technologies Corporation*.

Hereby enters this disclaimer to claims 1 through 5 of said patent.

Dedications

3,773,671.—*Ali Ghalib Mohammed Hussain*, Elizabeth, N.J. PRODUCTION OF GRANULAR MIXTURES. Patent dated Nov. 20, 1973. Dedication filed Mar. 20, 1980, by the assignee, *Colgate-Palmolive Company*.

Hereby dedicates to the Public the entire remaining term of said patent.

4,140,724.—*Kayson Nyi*, Sellersville and *Alan W. Kohn*, Schwenksville, Pa. SELECTIVE PREPARATION OF POLYOL MONOETHERS OF DICYCLOPENTADIENE. Patent dated Feb. 20, 1979. Dedication filed Mar. 7, 1980, by the assignee, *Rohm and Haas Company*.

Hereby dedicates to the Public the entire term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing, in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231 for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a nondisclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY

OTJAG, Chief, Intellectual Property Division, Room 2D 444 Pentagon, Washington, D.C. 20310

Patent application 6-000,041. High-G Gimbal Platform. Filed Jan. 2, 1979.

Patent application 6-000,324. Electronic Correction of Optical Aberrations in a Laser Seeker. Filed Jan. 2, 1979.

Patent application 6-000,325. Holographic Stepwise Zoom Lens for Beamrider Missiles. Filed Jan. 2, 1979.

Patent application 6-000,326. A Holographic Corrector Plate for Laser Designators. Filed Jan. 2, 1979.

Patent application 6-000,327. Gradient Index of Refraction Windows for Missile Seekers. Filed Jan. 2, 1979.

Patent application 6-004,979. A Method and Apparatus for Determining Aerosol Size Distribution. Filed Jan. 22, 1979.

Patent application 6-008,464. Semi-Active Laser Seeker Gyroscope. Filed Feb. 1, 1979.

Patent application 6-008,628. ROACH Generator. Filed Feb. 1, 1979.

Patent application 6-008,808. Binary Integrator for Fixed Cell Radar Alarm Data. Filed Feb. 2, 1979.

Patent application 6-013,947. Optical Beam Scanner. Filed Feb. 22, 1979.

Patent application 6-019,539. Minimum Length Diffuser for Chemical Laser. Filed Mar. 12, 1979.

Patent application 6-021,742. A System for Ripple and Noise Reduction in a Multiple Power Supply. Filed Mar. 19, 1979.

Patent application 6-027,542. Regulating Means for D-C Battery System. Filed Apr. 5, 1979.

Patent application 6-075,470. Fluidic Recoil Buffer for Small Arms. Filed Sept. 14, 1979.

Patent application 6-075,565. Electrolysis of Lead Azide. Filed Sept. 14, 1979.

Patent application 927,324. HCl or DCl Chemical Laser Using Laser Induced Chemistry. Filed July 24, 1978.

Patent application 927,327. HF or DF Chemical Laser Using Laser Induced Chemistry. Filed July 24, 1978.

Patent application 928,219. Tactical Nuclear Slide Rule. Filed July 26, 1978.

Patent application 931,235. Variable Angle of Incidence Reflectometer With a Continuous Read Out. Filed Aug. 7, 1978.

Patent application 933,312. Rocket Detent and Release Mechanism. Filed Aug. 14, 1978.

Patent application 938,560. Tactical Nuclear Slide Rule for a Plurality of Environments. Filed Aug. 31, 1978.

Patent application 941,531. Rate Sensor. Filed Sept. 11, 1978.

Patent application 942,721. A Method for Measuring Range to a Rocket in Flight Employing a Passive Ground Tracker Station. Filed Sept. 15, 1978.

Patent application 944,833. A System Concept for All-Weather Intercept of Tanks From a Helicopter. Filed Sept. 22, 1978.

Patent application 949,325. Coherent Optical Correlator. Filed Oct. 6, 1978.

Patent application 951,925. Liquid Nitrogen Level Indicator. Filed Oct. 16, 1978.

Patent application 954,793. Light Emitting Diode Beacons for Command Guidance Missile Track Links. Filed Oct. 25, 1978.

Patent application 956,137. Unstable Optical Resonators With Tilted Spherical Mirrors. Filed Oct. 30, 1978.

Patent application 961,334. Matrix Nozzle for Mixing Lasers. Filed Nov. 16, 1978.

Patent application 962,273. Smokeless Propellant Compositions Having Polyester or Polybutadiene Binder System Crosslinked With Nitrocellulose and Method of Preparing the Same. Filed Nov. 20, 1978.

Patent application 963,065. High Efficiency Propulsion System. Filed Nov. 22, 1978.

Patent application 964,115 Power Transition Circuit. Filed Nov. 27, 1978.

Patent application 968,131. Polarization Suppression of Parasitic Modes. Filed Dec. 11, 1978.

Patent application 972.178. Frequency Synthesizer Extending Method and Apparatus. Filed Dec. 21, 1978.

Patent application 972,179. Logarithmic Lock-In Amplifier. Filed Dec. 21, 1978.

Patent application 973.367. Light Operated Measuring System. Filed Dec. 26, 1978.

Patent 4,108,721. Axisymmetric Fluidic Throttling Flow Controller. Filed June 14, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,118,702. Doppler Distance Measuring System. Filed Apr. 22, 1959. Patented Oct. 3, 1978. Not available NTIS.

Patent 4.119.039. Fuze System. Filed May 29, 1961. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,122,776. Dynamic Clamp Circuits. Filed Sept. 3, 1954. Patented Oct. 13, 1978. Not available NTIS.

Patent 4,124,281. Scheme for Terminal Guidance Utilizing Acousto-Optic Correlator. Filed June 7, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,126.394. Optical Cant Sensor for Mortars. Filed Aug. 9, 1977. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,128,836. Time Delay Computer for Ordnance Fuse. Filed Oct. 14, 1960. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,133,612. Endless Fiber Interferometer Rotary Motion Sensor. Filed July 6, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4.138,893. Hydrostatic Accelerometer. Filed Dec. 9, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,139,849. Doppler Fuzing System Having a High Resistance to Noise and Jamming. Filed Sept. 3, 1954. Patented Feb. 13, 1979. Not available NTIS.

Patent 4.148.126. Tool and Method for Assembling Threaded Burster Retainer in a Projectile. Filed Mar. 31, 1978. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,150,882. Identification Code Generator for High Speed Motion Picture Photography. Filed Oct. 29, 1976. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,161,348. Preassembled Fiber Optic Security Seal. Filed Aug. 9, 1977. Patented July 17, 1979. Not available NTIS.

Patent 4,163,423. Proximity Fuze. Filed Apr. 18, 1962. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,164,905. Lumped Neutralization Coil Arrangement for Inductance Fuze. Filed Dec. 22, 1971. Patented Aug. 21, 1979. Not available NTIS.

Patent 4,164,961. Fluidic Pressure/Flow Regulator. Filed July 28, 1977. Patented Aug. 21, 1979. Not available NTIS.

Patent 4,165,503. Hydrostatic Seismic Sensor. Filed Dec. 9, 1977. Patented Aug. 21, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent application 6–061,557. Helical Periodic Magnet. Filed July 27, 1979.

Patent application 6–062,591. Closed Cycle Annular-Return Gas Flow Electrical Discharge Laser. Filed July 31, 1979.

Patent application 6–062.592. Mechanical Heat Transfer Device. Filed July 31, 1979.

Patent application 6–063,499. Gun Alignment Adjusting Device. Filed Aug. 3, 1979.

Patent 4,166,416. Obturating Split Disc. Filed Apr. 28, 1978. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,166,597. Stowable and Inflatable Vehicle. Filed May 9, 1974. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,166,598. Vehicle Enshrouding Apparatus. Filed May 30, 1974. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,168,473. Internal Arrester Beam Clipper. Filed Nov. 18, 1977. Patented Sept. 18, 1979. Not available NTIS.

Patent 4,170,009. Multiple Channel Electronic Countermeasures Receiver System. Filed Dec. 3, 1963. Patented Oct. 2, 1979. Not available NTIS.

Patent 4.170,025. Low Contrast Measurement Apparatus. Filed June 6, 1978. Patented Oct. 2, 1979. Not available NTIS.

Patent 4,168,501. Method and System for Moving Target Elimination and Indication. Filed Mar. 10, 1972. Patented Sept. 18, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administrative Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–081,245. Precooked Potato Products. Filed Oct. 2, 1979.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 934,768. Process for Producing Hydrogen from Water Using Cobalt and Barium Compounds and Compositions Useful Therein. Filed Aug. 17, 1978.

Patent application 936,459. Method for Exploring and Discovering Uranium Deposits Within a Petrofluid System. Filed Aug. 24, 1978.

Patent application 936,460. Preparation of U_3O_8. Filed Aug. 24, 1978.

Patent application 966,522. Method for Immobilizing Radioactive Iodine. Filed Dec. 4, 1978.

Patent application 966,710. Clock Distribution System for Digital Computers. Filed Dec. 5, 1978.

Patent application 970,842. Gaseous Trace Impurity Analyzer and Method. Filed Dec. 18, 1978.

Patent 4,148,612. Method and Apparatus for Detecting and Measuring Trace Impurities in Flowing Gases. Filed Sept. 7, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,155,832. Hydrogenation Process for Solid Carbonaceous Materials. Filed Dec. 23, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,156,758. Electrolyte Composition for Electrochemical Cell. Filed Aug. 9, 1978. Patented May 29, 1979. Not available NTIS.

Patent 4,157,528. Wellbore Pressure Transducer. Filed Nov. 8, 1977. Patented June 5, 1979. Not available NTIS.

Patent 4,158,720. Lithium-Aluminum-Iron Electrode Composition. Filed Dec. 28, 1977. Patented June 19, 1979. Not available NTIS.

Patent 4,158,772. Device for Collecting and Analyzing Matrix-Isolated Samples. Filed May 2, 1978. Patented June 19, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

Patent application 6–047,541. Recovery of Metal Values From Lead Smelter Matte. Filed June 11, 1979.

Patent application 6–048,408. Capacitance Probe Sensor Device. Filed June 14, 1979.

Patent application 6–055,216. Mine Face Ventilation System. Filed July 6, 1979.

Patent application 6–060,101. Method of In Situ Mining. Filed July 24, 1979.

Patent 4,163,393. Void Detector Systems. Filed Aug. 4, 1978. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,165,042. Rotary Jaw Crusher. Filed Apr. 12, 1978. Patented Aug. 21, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–023,043. Processor-Aided Fire Detector. Filed Mar. 22, 1979.

Patent application 6–054,048. Dismountable Inductively-Coupled Plasma Torch Apparatus. Filed July 2, 1979.

Patent application 6–060,943. Method to Eliminate Fiber Interferometer Reflections. Filed July 26, 1979.

Patent application 6–066,200. Supercorroding Galvanic Cell Alloys for Generation of Heat and Gas. Filed Aug. 13, 1979.

Patent application 6–066,201. Portable Diver Heat Generating System. Filed Aug. 13, 1979.

Patent application 6–066,944. Simulated Oxygen Breathing Apparatus. Filed Aug. 16, 1979.

Patent application 6–067,977. Beamformer for Arrays With Rotational Symmetry. Filed Aug. 20, 1979.

Patent application 6–068,999. Dual Ground Plane Coplanar Fed Microstrip Antennas. Filed Aug. 23, 1979.

Patent application 6–075,631. Polyphthalocyanine. Filed Sept. 14, 1979.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–067,595. A Hydraulic Actuator Mechanism to Control Aircraft Spoiler Movements Through Dual Input Commands. Filed Aug. 17, 1979.

Patent application 6–070,366. Small Conductive Particle Sensor. Filed Aug. 28, 1979.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent 3,632,774. Method of Treating Rheumatoid Arthritis With Histidine. Filed Mar. 30, 1970. Patented Jan. 4, 1972. Not available NTIS.

Patent 3,867,539. Method of Producing Anorexia as a Treatment for Obesity. Filed Apr. 27, 1973. Patented Feb. 18, 1975. Not available NTIS.

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 19, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-18-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-8-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	4-19-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	8-20-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-1-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	2-18-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-23-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	9-5-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-3-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	4-25-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-19-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	4-2-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-9-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-6-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	11-28-78

Expiration of patents: The patents within the range of numbers indicated below expire during April 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,083,367 to 3,088,113, inclusive
Plant Patents ..... Numbers 2,244 to 2,257, inclusive

REISSUES

MAY 20, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,275

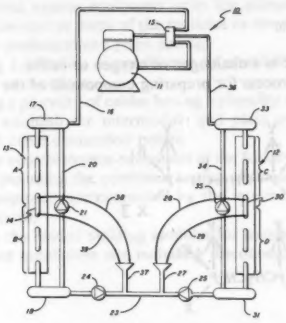
HEAT EXCHANGER

James J. del Toro, North Syracuse, and Rudy C. Bussjager, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Original No. 4,057,976, dated Nov. 15, 1977, Ser. No. 720,722, Sep. 7, 1976. Application for reissue Jan. 5, 1979, Ser. No. 1,323

Int. Cl.[2] **F25B** *1/00, 13/00;* **F28F** *27/02*

U.S. Cl. 62—115 **10 Claims**



18. A method of routing refrigerant through the heat exchanger arranged to serve as a condenser when the flow of refrigerant to the exchanger is in one direction and as an evaporator when the flow to the exchanger is in the opposite direction, the steps including

dividing the heat exchanger into a plurality of heat transfers zones arranged so that when air flows through the heat exchanger, the air flows through the zones in parallel paths,

directing refrigerant in series flow progression through each of the heat transfer zones when the flow to the exchanger is in one direction,

rerouting the refrigerant through each of the heat transfer zones simultaneously when the flow to the exchanger is in the opposite direction, and

arranging the heat transfer zones such that each subsequent zone in the direction of flow in said one direction has less circuits than the previous zone.

Re. 30,276

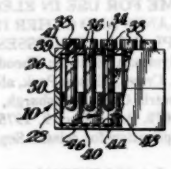
APPARATUS FOR STOPPER REMOVAL

Vernon C. Rohde, Newtown, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,068,798, dated Jan. 17, 1978, Ser. No. 728,001, Sep. 29, 1976. Application for reissue Apr. 20, 1978, Ser. No. 898,445

Int. Cl.[2] **B04B** *5/02*

U.S. Cl. 233—26 **5 Claims**



1. Apparatus for removing stoppers from test tubes using a centrifuge having a swinging bucket-type carrier comprising, in combination,

a rack to be placed in said bucket-type carrier and having upper and lower separable members,

said upper member having an upper surface defining plural apertures receiving said test tubes,

at least a portion of each said stopper having an enlarged portion with an outside diameter greater than the diameter of its associated test tube, thereby to permit said test tubes to hang from said upper surface supported only by their respective stoppers,

said lower member having a bottom,

supporting means associated with said lower member for supporting said test tubes against lateral movement, and

the spacing between the bottom of said test tubes and said lower member bottom being greater than the length of the stoppers along the axis of said tubes in contact with said tubes, whereby subjecting said rack to centrifugal force separates said test tubes from said stoppers to rest on said lower member bottom such that said stoppers can be discarded and access had to the contents of said test tubes by removing said upper member from said lower member.

Re. 30,277

ELECTRICAL TAB RECEPTACLE

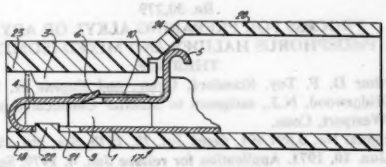
Reginald J. Simmons, South Harrow, England, assignor to AMP Incorporated, Harrisburg, Pa.

Original No. 3,976,348, dated Aug. 24, 1976, Ser. No. 572,500, Apr. 28, 1975. Application for reissue Feb. 10, 1978, Ser. No. 876,584

Claims priority, application United Kingdom, May 3, 1974, 19542/74

Int. Cl.[2] **H01R** *13/62*

U.S. Cl. 339—74 R **17 Claims**



5. An electrical connector, comprising:

a. a first terminal formed from sheet metal and having a conductor receiving end and an opposite channel-shaped, mating end for making electrical engagement with a complementary second terminal, a tongue on the first terminal having means thereon for releasably engaging the second terminal with the free end of the tongue being located intermediate the conductor receiving end and the mating end; and

b. a housing of insulating material having a passage therein in which the first terminal is located, retaining means on the housing for retaining the first terminal in the passage and for permitting limited axial movement therebetween, and release means on the housing positioned to engage the free end of the tongue

whereby movement of the housing relative to the first terminal causes said release means to engage the tongue free end to thereby release the first terminal from a complementary second terminal.

Re. 30,278

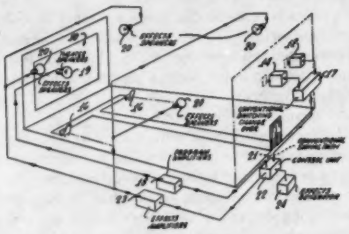
SPECIAL EFFECTS GENERATION AND CONTROL SYSTEM FOR MOTION PICTURES

Richard J. Stumpf, Woodland Hills; Waldon O. Watson, Universal City, and Robert J. Leonard, Northridge, all of Calif., assignors to MCA Systems, Inc., Universal City, Calif.

Original No. 3,973,839, dated Aug. 10, 1976, Ser. No. 5,3 7,194, Dec. 30, 1974. Application for reissue May 19, 1978, Ser. No. 907,838

Int. Cl.[3] G03B *31/00*

U.S. Cl. 352—5 47 Claims



1. A method of *realistically* simulating a specified physiological and psychological sensation *relating to physical movement associated with low frequency impact and shock wave phenomena,* in an audience viewing a visual display [in] *of such phenomena within* a theater *space,* said method comprising the steps of:

generating *a band of simultaneously present frequency spectrum components including* random frequencies and transients having *simultaneous plural* components in at least the infrasonic frequency range; and

applying, in synchronism with said visual display, said frequencies and transients to acoustic transducers located [in] *within* said theater *space, to provide acoustical output including said random frequencies and transients,* at sufficient power levels to induce *in the theater audience* the specified sensation [in the audience] *of substantial physical movement corresponding to low frequency impact and shock wave phenomena.*

Re. 30,279

PROCESS FOR PREPARING ALKYL OR ARYL PHOSPHORUS HALIDES AND MIXED ISOMERS THEREOF

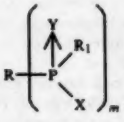
Arthur D. F. Toy, Stamford, Conn., and Eugene H. Uhing, Ridgewood, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Original No. 3,897,491, dated Jul. 29, 1975, Ser. No. 151,955, Jun. 10, 1971. Application for reissue Jan. 4, 1979, Ser. No. 854

Int. Cl.[2] C07F *9/42*

U.S. Cl. 260—543 P 51 Claims

1. A method for preparing compounds of the formula:



wherein R is a C_1 to C_{20} alkyl radical, cycloalkyl of 5–6 carbons in the ring, an aryl radical of up to 3 fused rings, and biphenyl, R_1 represents a C_1 to C_{20} alkyl radical, cycloalkyl of 5–6 carbons on the ring, an aryl radical of up to 3 fused rings, biphenyl, or a halogen of chlorine, or bromine, X is a halogen of chlorine or bromine, and Y is a chalcogen of oxygen or sulfur, and m is an integer between 1 and n, defined hereinafter, inclusive, comprising reacting, under at least an autogenous pressure *in a reaction zone capable of withstanding elevated pressure* at a temperature of from about 200° C. to about 450° C. an alkyl or aryl halide of the formula:

$$RX_n$$

wherein R is as defined above, and X is a halogen of chlorine, or bromine, and n is an integer and represents the number of halogens attached to the R group, with a trivalent phosphorus compound of the formula

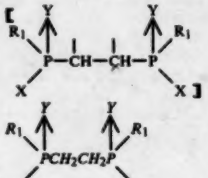
$$R_1P(X)_2$$

wherein R_1 and X are as defined above, in the presence of a phosphorus compound of the formula:

$$P_4Y_{10}$$

wherein Y is a chalcogen of oxygen or sulfur.

44. A process for preparing compounds of the formula:



wherein R_1 is a C_1 to C_{20} alkyl radical, cycloalkyl of 5–6 carbons in the ring, an aryl radical of up to 3 fused rings, biphenyl, or a halogen of chlorine or bromine, Y is a chalcogen of oxygen or sulfur, and X is a halogen of chlorine, or bromine, [the free valence bonds being satisfied by hydrogen or C_1—C_4 alkyl,] comprising reacting *ethylene,* under at least autogenous pressure *in a reaction zone capable of withstanding elevated pressure,* at a temperature of from about 200° C. to about 450° C. [an ethylenically unsaturated compound of the formula:]

with a phosphorus compound of the formula:

$$R_1P(X)_2$$

in the presence of a phosphorus compound of the formula

$$P_4Y_{10}$$

R_1, X and Y being as defined hereinbefore.

Re. 30,280

MODULAR OPERATING CENTERS AND METHODS OF BUILDING SAME FOR USE IN ELECTRIC POWER GENERATING PLANTS AND OTHER INDUSTRIAL AND COMMERCIAL PLANTS, PROCESSES AND SYSTEMS

Paul A. Berman, Plymouth Meeting; Theodore C. Giras, Pittsburgh, and Roy E. Crews, Allison Park, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 3,925,679, dated Dec. 9, 1975, Ser. No. 399,582, Sep. 21, 1973. Application for reissue Sep. 22, 1977, Ser. No. 835,569

Int. Cl.[2] B65D *85/00*

U.S. Cl. 290—1 R 20 Claims

1. A method of building an operating center for a plant

designed to produce goods or services, the steps of said method comprising:

loading each of a plurality of transportable room-size building modules with predetermined electrical control system equipment units at a factory site, such building modules constituting structural parts of a unitary operating center building and such control system equipment units constituting parts of a system for use in monitoring and/or controlling the operation of the production plant;

establishing at the factory site predetermined intramodule connections among the control equipment units within each building module;

establishing at the factory site predetermined intermodule connections among the control system equipment units in different ones of the building modules;

establishing at the factory site predetermined connections to the control system equipment units for ultimate attachment from one or more of the modules to the production plant at predetermined plant points;

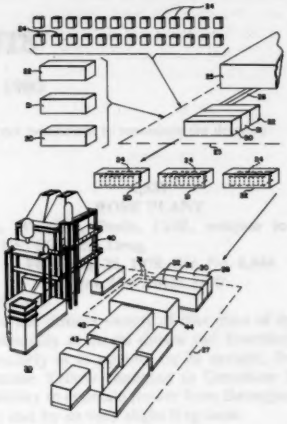
employing a plurality of conductors to establish the intramodule connections;

employing a plurality of cables having a plurality of conductors to establish the intermodule and plant connections through cable connection points;

testing the control system equipment at the factory site, such testing including the combined testing of the control system equipment interconnected by the intermodule cable connections;

preparing the loaded building modules for transportation to the plant installation site including disconnecting the intermodule and any test connections at the cable connection points;

transporting the modules to the plant site;



and installing the modules and establishing the cable connections from the modules to the plant points and reestablishing the intermodules cable connection.

PLANT PATENTS

GRANTED MAY 20, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,536

AFRICAN VIOLET CULTIVAR NAMED GRACE

Arnold W. Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Feb. 26, 1979, Ser. No. 15,310

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct African violet, substantially as herein shown and described, characterized by its distinct light blue flowers borne in clusters on sturdy stems to the side and somewhat above dark shiny green foliage which, in turn, is characterized by pink under sides.

4,537

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Jan. 26, 1979, Ser. No. 6,644

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by its upright, free blooming plant, Chrome Yellow changing to Geranium Lake flower color, its ability to maintain flower form throughout the life of the flower and by its very slight fragrance.

PLANT PATENTS

GRANTED MAY 26, 1970

PATENTS

GRANTED MAY 20, 1980

ERRATA

For CLASS	See PATENT NO.
433–189	4,203,216
433–220	4,203,217
433–176	4,203,218
433–074	4,203,219
433–228	4,203,220
433–117	4,203,221
433–129	4,203,222
433–075	4,203,223
368–073	4,203,278
368–243	4,203,279
368–187	4,203,280
368–124	4,203,281
368–180	4,203,282
410–067	4,203,372
074–335	4,203,375
228–001 A	4,203,531
371–024	4,203,543
244–003.23	4,203,569
273–336	4,203,592
430–067	4,203,764
430–252	4,203,765
430–243	4,203,766
430–376	4,203,767
430–388	4,203,768
430–631	4,203,769
430–270	4,203,770
435–284	4,203,801
435–188	4,203,802
548–194	4,203,899
548–239	4,203,900
556–401	4,203,913
556–428	4,203,914
568–379	4,203,924
568–362	4,203,925
568–319	4,203,926
568–401	4,203,927
568–424	4,203,928
585–022	4,203,930
525–004	4,203,931
525–398	4,204,052

ERRATA—Continued

For CLASS	See PATENT NO.
260–243.3	4,204,061
370–095	4,204,093
371–025	4,204,114
375–025	4,204,163
455–135	4,204,164
455–226	4,204,165
455–289	4,204,166
455–231	4,204,167
455–330	4,204,168
455–175	4,204,169
367–154	4,204,188
364–200	4,204,249
364–200	4,204,250
364–200	4,204,251
364–200	4,204,252
364–200	4,204,253
364–200	4,204,254
364–425	4,204,255
364–431	4,204,256
364–474	4,204,257
364–494	4,204,258
364–497	4,204,259
364–554	4,204,260
364–607	4,204,261
364–822	4,204,262
363–068	4,204,263
363–071	4,204,264
363–071	4,204,265
363–098	4,204,266
363–085	4,204,267
363–135	4,204,268

PATENTS

GRANTED MAY 20, 1980

GENERAL AND MECHANICAL

4,203,167

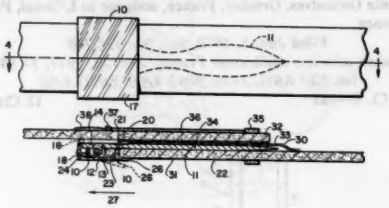
SIMULATED BELT BUCKLE AND APPENDAGE

Walter W. Collins, Rock Hill, S.C., assignor to Jenkins Metal Corporation, Gastonia, N.C.

Filed Dec. 1, 1978, Ser. No. 965,563

Int. Cl.[2] A41F *9/00*

U.S. Cl. 2—322 **8 Claims**



1. A simulated belt buckle and appendage comprising a decorative plate having a free end, an appendage including an elongated portion extending beyond the free end of the decorative plate, a sheath for housing the appendage, means normally retaining the appendage within the sheath, and means pivotally interconnecting the decorative plate and the appendage to permit relative movement between the decorative plate and the appendage during removal of the appendage from the sheath, whereby said removal is facilitated.

4,203,168

INTRAOCULAR LENS

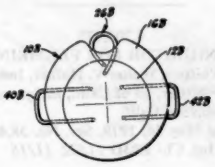
Edgar A. Rainin, 5747 Tamarack Way, Concord, Calif. 94526, and Emery Major, Larkspur, Calif., assignors to Edgar A. Rainin, Danville, Calif.

Continuation of Ser. No. 867,806, Jan. 9, 1978, abandoned, which is a division of Ser. No. 632,834, Nov. 17, 1975, Pat. No. 4,085,467. This application Oct. 2, 1978, Ser. No. 947,353

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[2] A61F *1/16, 1/24*

U.S. Cl. 3—13 **3 Claims**



1. An intraocular lens device intended for insertion within the eye, the iris of the eye having at least an opening therethrough comprising:

a. a lens portion intended for placement against one side of the iris, said lens portion adapted for covering at least a portion of the pupil;

b. means for stabilizing said lens portion, said lens portion stabilizing means being affixed to said lens portion and intended to extend through the pupil of the eye to the other side of the iris opposite the one side thereof against which said lens portion is placed; said lens portion stabilizing means comprising two loops each being fixed to said lens portion and extending therefrom to generally opposite peripheral regions of said lens portion;

c. means for anchoring said lens portion, said lens portion anchoring means intended for extending through the iris opening and being affixed to said lens portion such that said lens portion lies over the pupil of the eye, said anchoring means comprising flexible resilient loop means for passing through said iris opening when compressed into an elongated body and prevented from passing back through said iris opening when compression is released and said loop means resiliently expands to an original shape which defines a terminous having a dimension greater than the width of said iris opening through which said loop means is intended to be passed, thereby facilitating anchoring of said lens within the eye.

4,203,169

URINE COLLECTION DEVICE

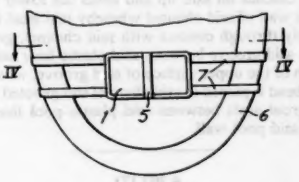
Gerald Dale, Chelmsford, England, assignor to Medeci Developments Limited, London, England

Filed Sep. 14, 1978, Ser. No. 942,353

Claims priority, application United Kingdom, Sep. 14, 1977, 38418/77

Int. Cl.[2] A47K *11/00*

U.S. Cl. 4—144.1 **8 Claims**



1. A mid-stream urine collection device comprising:

receptacle means having an interior and edge means surrounding an aperture communicating with said interior, resilient sheet material covering said aperture and having two edge portions, urine soluble adhesive adhesively connecting together said two edge portions, said adhesive means being adapted to release said edge portions when wetted with urine, and means securing said sheet material to said receptacle means so as to close said aperture, said sheet material extending over said aperture under tension and around said edge means in the direction toward the bottom of said receptacle means, with said edge portions within the area of said aperture,

whereby when said edge portions separate in response to impingement of urine on said adhesive means said sheet material moves to open said aperture away from said receptacle means interior, thereby diverting therefrom urine previously received on said sheet material.

4,203,170

VINYL LINER AND SEALING GROOVE ASSEMBLY FOR POOLS

Jay A. Lankheet, 579 Ottawa Ave., Holland, Mich. 49423

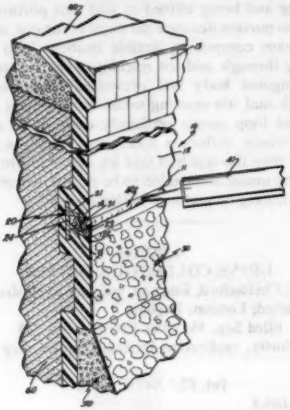
Filed Nov. 7, 1978, Ser. No. 958,449

Int. Cl.[2] E04H *3/16*

U.S. Cl. 4—172 **12 Claims**

1. A plastic pool wall having a groove in its face which includes a separate embedded channel receiving the bead of a plastic pool liner, the improvement comprising: said channel including spaced upper and lower walls joined by a base wall,

said upper wall terminating short of said pool wall face such that the upper surface of said groove is defined in part by said channel upper wall and by the plastic material of said pool wall, said lower wall of said channel being bent up to define a lip at the end of said lower wall to catch said bead, the relative size of said bead and the distance between said lip and said leading edge of said upper wall of said channel being such that



said bead catches on said lip and abuts the lower surfaces of said upper wall of said channel whereby said bead is locked in place solely through contact with said channel, grout sealant located in said groove between said plastic liner and said plastic portion of the upper surface of said groove, whereby when said liner bead is placed in said channel and grouted within said groove, grout seals between said plastic pool liner and said plastic of said pool wall.

4,203,171

SHOWER CABINETS

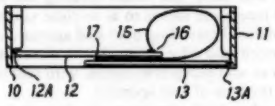
John A. Bolt, Beaconsfield, England, assignor to Terrapin International Limited, London, England

Filed Oct. 28, 1975, Ser. No. 626,458

Claims priority, application United Kingdom, Nov. 7, 1974, 48287/74

Int. Cl.[2] A47K *3/23, 3/24*

U.S. Cl. 4—146 **1 Claim**



1. A shower cabinet comprising a pair of doors hinged on vertical hinges, said doors overlapping each other when closed and a front curtain support including a horizontally elongated band which has a thin dimension in a transverse horizontal direction and which has a wide dimension in a vertical direction, which is rigid vertically and curvilinearly flexible in a horizontal plane in all positions of the doors, wherein the band is made of synthetic plastics material 0.75 to 1.5 inch deep and one sixteenth to one eighth inch thick, each end of the band is fixed in a first hinge member which is hinged to a second hinge member that is fixed to the door the ends of the band being secured to said hinge members on the inside surfaces of the doors near their free vertical edges at the upper ends thereof such that when the doors are opened so as to be approximately parallel to each other, the band will extend between them in a horizontal plane and when the doors are closed the band will remain in said horizontal plane and will be hidden from view behind these doors and a curtain mounted on said band, the band and the curtain being automatically curved and straightened with opening and closing of the doors, so that when the doors are closed a first part of the band and curtain lie in a generally flat vertical plane between the doors and a second part of the curtain and band lie in a curved condition behind the doors.

4,203,172

SUPPORT FOR TOILET BOWL DEODORIZER BLOCK

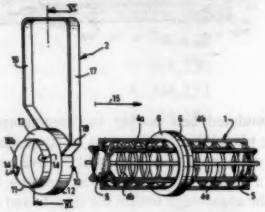
Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Jun. 5, 1978, Ser. No. 912,748

Claims priority, application France, Jun. 20, 1977, 77 18865

Int. Cl.[2] A61L *3/00*; B01J *4/00*; E03D *9/02*

U.S. Cl. 4—231 **12 Claims**



1. A support for a block of a product for the disinfection and/or deodorisation of a toilet bowl comprising: (a) a foraminous cage for holding a block of said product and having plural openings in its wall; (b) hook means attached to the cage in the central zone thereof to enable the cage to be suspended on the edge of a toilet bowl; (c) connection sleeve means integrally formed with said hook means and adapted to be fitted on to the assembled cage; and (d) means for securing said connection sleeve means to the cage; wherein said securing means comprise (da) means defining a rim in relief in the central zone of the cage, and (db) catch engagement means provided in relief on the inner wall of said connection sleeve means to engage within any one of said plural openings in the foraminous wall of the cage and shaped to allow the connection sleeve means to slide along the cage in one axial direction but to hold the connection sleeve means against movement along the cage in the opposite direction.

4,203,173

OVERFLOW INHIBITOR FOR PLUMBING FIXTURES

Earl L. Morris, Whittier; Walter V. Hafner, Industry, and Theodore J. Sally, Whittier, all of Calif., assignors to Acorn Engineering Co., Industry, Calif.

Filed May 14, 1979, Ser. No. 38,451

Int. Cl.[2] E03D *11/02, 11/18*

U.S. Cl. 4—427 **8 Claims**

1. A plumbing fixture with a toilet bowl, the toilet bowl having a P-trap coupled to the waste outlet thereof, including a toilet bowl overflow inhibiting means, comprising:

(a) a toilet bowl having a water supply pipe operably coupled therewith;

(b) an electrically-controlled flushing valve operably associated with said supply pipe for controlling the flow of water to the toilet bowl;

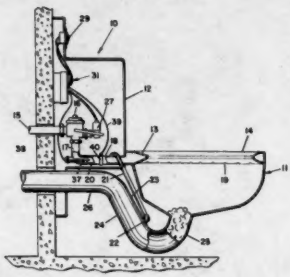
(c) a source of electricity for operating said valve;

(d) electrical switch means operably associated with the source of electricity for controlling the delivery of electricity to the valve for actuation thereof;

(e) an insulated electrical probe mounted in said water supply pipe;

(f) said electrical probe operably associated with a detection circuit means whereby said detection circuit disconnects said source of electricity when water is in said supply pipe and completes the circuit between said electrical probe and electrical ground;

(g) a blow-out jet pipe having an entrance and an outlet thereto, the entrance thereto being coupled in fluid communication with said supply pipe at the upper portion thereof and the outlet being coupled in fluid communication with the P-trap of the toilet bowl at the uprising portion thereof; and



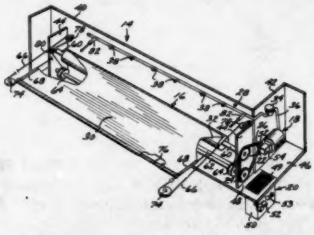
(h) means within said blow-out jet pipe for preventing the draining of water from the toilet bowl into the water supply pipe and into the blow-out jet pipe.

4,203,174

AUTOMATIC SWIMMING POOL COVER AND COVER WASHER

Neal Shults, 2844 Knoxville Ave., Long Beach, Calif. 90815

Filed Aug. 10, 1978, Ser. No. 932,523
Int. Cl.[2] E04H *3/19*; B08B *3/02*
U.S. Cl. 4—172 **10 Claims**



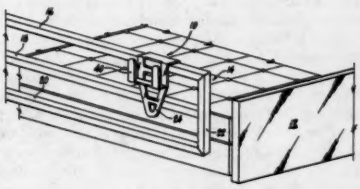
1. In an automatic motorized device for selectively and reversibly drawing an expansive cover laterally across a swimming pool by lines attached thereto which are coiled on takeup reels, and alternatively retracting said cover onto a roller, the improvement comprising a single electric motor for moving said cover having a shaft rotatable in a single direction and coupled in electrical isolation to a nonconductive belt drive that rotates separate roller driving means and reel driving means in a common drive line, separately actuable electrical clutch means associated, respectively, with said roller driving means and said reel driving means, an alternating current input circuit of at least 110 volts coupled through motor contact means to said electric motor, step-down transformer means connected to said alternating current input circuit with a low voltage output circuit to provide low voltage current through clutch contact means to alternatively actuate only one of said electric clutch means, separately manually actuable switches and clutch contact actuating means, associated with each of said electric clutch means to couple a selected one of said electrical clutch means to said low voltage output circuit and to lock out said other electric clutch means therefrom, and motor contact actuating means operable by both of said manually actuable switch closure means to energize said electric motor, and further characterized in that limit switches are provided at opposite ends of said pool employing magnets which are forced in longitudinal movement responsive to movement of said cover, and reed switches are located in longitudinal registration with said magnets and arranged in circuit to operate said clutch contact actuating means and open said motor contact actuating means when said magnets are carried into proximity therewith, whereby said motor is used to alternatively cover and uncover said pool cover spraying means for spraying a cleansing spray of water onto said cover at said roller as said cover is retracted and passes downward at a vertical tangent as it is rolled onto said roller, and said cover spraying means is equipped with valve means and electrically actuated solenoid means for controlling said valve means, and said solenoid means is electrically coupled to said low voltage output circuit for operation by one of said manually actuable switches for initiating retraction of said cover, and a delay circuit is coupled in circuit with said solenoid means for delaying actuation of said solenoid means, whereby a head of water is allowed to build up in said cover spraying means before said solenoid means is allowed to open said valve means.

4,203,175

SLIPPER HOLDER

Charles A. Heine, 730 Vera Dr., Arnold, Mo. 63010

Filed Sep. 8, 1978, Ser. No. 940,725
Int. Cl.[2] A47B *53/00*; A43D *5/00*
U.S. Cl. 5—503 **3 Claims**



1. A slipper holder for a hospital bed including upper and lower spaced bed rails, comprising:

(a) an upper bed rail,

(b) a lower bed rail disposed in spaced relation below said upper rail,

(c) a unitary body including:

1. an upper portion having rearwardly extending and downwardly depending hook means engageable with said upper bed rail and freely, upwardly removable from said rail, and
2. a lower depending portion integrally formed with said upper portion and having a rear bearing means disposed in spaced relation from said upper portion and engageable with said lower bed rail, and

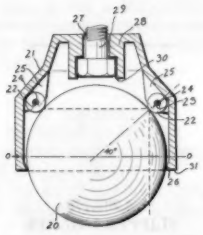
(d) a slipper support means including a pair of spaced upwardly extending finger portions disposed in fixed side-by-side relation and means connecting said portions with said body portion above the bearing means.

4,203,176
Patent Not Issued For This Number

4,203,177
CASTOR

Jack P. Kegg, 12/104 St. George Crescent, Drummoyne, N.S.W., Australia (2047); Colin A. Fuller, 25 Awatea Rd., St. Ives, Sydney, N.S.W., Australia (2075), and Geoffrey E. Kegg, 40 Boundary Rd., Wahroonga, Sydney, N.S.W., Australia (2076)

Continuation-in-part of Ser. No. 804,114, Jun. 6, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 926,044
Int. Cl.[2] B60B *33/08*
U.S. Cl. 16—24 **6 Claims**

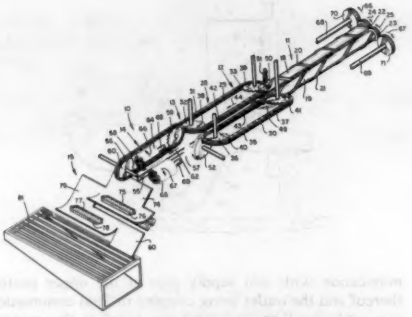


1. A castor comprising a socket member defined by a base portion and a cup portion extending from the base portion, the base portion being adapted to be affixed to the underside of an article, and the cup portion defining a generally dome-shaped cavity therein, and a ball receivable in the cavity in a manner to be freely rotatable in any direction in the cavity, the cup portion having six equally spaced rollers mounted in a cage in a manner to be arranged uniformly about the wall of the cavity in a plane which is tranverse to the axis of the cavity, whereby to be engageable with the ball and support the latter for rotatable movement within the cavity, the rollers being each supported on an axle which in turn is mounted at each end in complementary retaining portions in the cage, with the rollers being respectively freely rotatable in slots formed through the wall of the cage, the cage being adapted to be supported within the cavity of the socket member with the rotational axis of each roller being generally parallel to the tangent at the point of contact with the surface of the ball and being oblique to the axis of the cavity, while the points of contact between the rollers and the ball being no greater than 45° with respect to the equatorial plane of the ball, the cup portion having an annular rim defining an open end of the cavity through which a portion of the ball, when it is mounted in the cavity, outwardly projects, and means adjacent the annular rim to maintain the ball within the cavity.

4,203,178
GIZZARD PROCESSING SYSTEM

Jocobus E. Hazenbroek, Burg. De Zeeuwstaat 52, Numansdorp, Netherlands

Filed Jul. 25, 1978, Ser. No. 927,825
Int. Cl.[2] A22C *21/00*
U.S. Cl. 17—50 **6 Claims**



1. A method of processing poultry gizzards comprising moving the gizzards in sequence on a pair of oppositely rotating spirally threaded rolls along a rectilinear path first with entrails suspended freely below the gizzards, and as the gizzards move along the path beyond the rolls engaging the gizzards on opposites sides of the gizzards with a pair of side-by-side chain conveyor means and moving the gizzards along the path with the pair of chain conveyor means, and while the gizzards are moved along the path by the pair of chain conveyor means cutting the entrails away from the gizzards, and cutting upwardly into the lower portion of the gizzards, releasing the gizzards with the pair of chain conveyor means, engaging the gizzards from above with a chain conveyor means and moving the gizzards along the path with the chain conveyor means, and while the gizzards are moved along the path by the chain conveyor means separating the portions of the gizzards cut apart by the upward cut into the gizzards and removing loose matter from inside the gizzards.

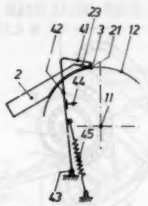
4,203,179
MACHINE FOR SKINNING FISH OR FISH FILLETS

Horst K. H. Braeger, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co KG, Lübeck, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,748
Int. Cl.[2] A22B *5/16*
U.S. Cl. 17—62 **14 Claims**

1. A machine for skinning fish or fish fillets, comprising a skinning knife, a driven skinning roller having a circumferential surface adapted to support said fish or fish fillets and carry the same in a feeding path to said skinning knife, said skinning knife having a cutting edge formed by a presser face extending downstream from said cutting edge and forming with said circumferential surface of said skinning roller a narrow space for receiving the fish skin and for coacting with said circumferential surface to effect a skin gripping and pulling action, and by a back face disposed at an acute angle to said presser face, and a catching face formed on catching face carrying means arranged above said back face adjacent said cutting edge and

resiliently displaceable substantially in the direction of travel of said fish or fish fillets, said catching face carrying means including biasing means urging said catching face in a direction opposite to the direction of travel of said fish to a position in which it overlies and covers over said cutting edge of said skinning knife with said catching face being positioned in said feeding path to be initially engaged by said fish or fish fillet as



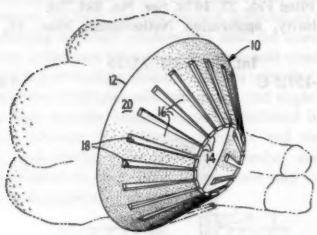
the latter approaches said skinning knife, and being adapted to block the leading end of the fish or fish fillet and force the skin thereof beneath said cutting edge and into said space between the knife presser face and the skinning roller surface, said catching face being then movable in the opposite direction against the face of said biasing means to a position in which it uncovers and exposes said cutting edge.

4,203,180

HOLDER FOR VEGETABLES SUCH AS BROCCOLI

Charles D. Striplin, c/o Striplin Machine & Engineering Co., P.O. Box 515, Benicia, Calif. 94510

Filed Mar. 9, 1979, Ser. No. 19,106
Int. Cl.[2] B65D *67/02*
U.S. Cl. 24—17 B **6 Claims**



1. A holder for vegetables or the like, comprising a structure having in its unstressed condition a relatively thin side wall in the form of a truncated cone and with the side wall divided into a plurality of inward-sloping flexible fingers leading from a solid base of the cone to the terminal ends of the fingers whereby said structure can be forced over an irregular article and the fingers will conform to the shape of the irregular article and hold the same.

4,203,181

CANOPY RELEASE MANIPULATING HANDLE

John A. Gaylord, San Diego, and Kenneth A. Marks, Cherry Valley, both of Calif., assignors to H. Koch & Sons Division, Gulf & Western Manufacturing Company, Anaheim, Calif.

Filed Aug. 21, 1978, Ser. No. 935,166
Int. Cl.[2] B64D *17/30*; A44B *11/25*
U.S. Cl. 24—230 A **9 Claims**

1. In a manipulating handle for a releasable strap connector, said strap connector having a female member with spaced ears, and having socket holes therethrough to receive male connector members, an oscillatable locking bar intersecting said socket holes and being adapted to engage said male members in one position and to release said male members in another position, and a lever between said ears connected to the locking bar for oscillating the same between said engaging and releasing positions,

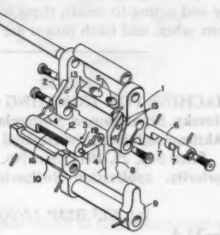
the improvement of

a manipulating handle on the lever including

a hollow member on said lever,

said ears having a keeper socket at least in one of said ears,

at least one bolt element axially reciprocable in said hollow member, a portion of said bolt element being insertable in said keeper pocket for interlocking said handle member



and said ear in said engaging position of said lever and of said oscillatable bar,

a rotatable manipulating member in said hollow member being at least partially exposed to the exterior of said hollow member to an extent sufficient for manual engagement for rolling manipulation,

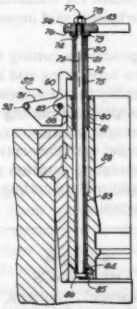
and connecting means between said bolt element, said hollow member and said manipulating member for reciprocating said bolt element upon rotation of said rotatable manipulating member thereby to withdraw said bolt element from said keeper pocket and thereby to permit manipulating of said lever.

4,203,182

SLIP ASSEMBLY

George I. Boyadjieff, Anaheim, Calif., and Jerry A. Gill, Houston, Tex., assignors to Varco International, Inc., Orange, Calif.

Continuation of Ser. No. 877,309, Feb. 13, 1978, abandoned. This application Jan. 15, 1979, Ser. No. 3,293
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—263 D **32 Claims**



1. A slip assembly comprising:

a slip bowl structure adapted to be received and supported within an opening in a well drilling rotary table in a relation to turn with the table;

a carrier structure mounted to said bowl structure for upward and downward movement relative thereto;

a plurality of slips which have inner faces for gripping a well pipe and which are connected to said carrier structure for movement upwardly and downwardly therewith relative to said bowl structure between lower active positions and upper retracted positions;

said bowl structure and said slips having engaging wedge surfaces acting to cam the slips inwardly into tight gripping engagement with a well pipe upon downward movement of the slips to said active positions;

latch means for releasably retaining said carrier structure and slips in said lower active positions; and

yielding means urging said carrier structure and slips upwardly and acting to return them to said upper retracted positions when said latch means are released.

4,203,183

MACHINE FOR TRIMMING CASTINGS

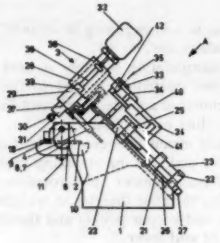
Rudolf Pavlovsky, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Sep. 29, 1978, Ser. No. 946,868

Claims priority, application Switzerland, Oct. 19, 1977, 12723/77

Int. Cl.[2] B23P *17/00*

U.S. Cl. 29—33 A **13 Claims**



1. A machine for processing cast workpieces to remove flashing, core burrs, sprues and risers comprising the combination of

a base;

a worktable supported by said base for supporting a workpiece to be processed;

a milling assembly mounted on said base, said milling assembly having a milling cutter movable to contact the workpiece; and

impact cutting tool means for contacting and cutting away portions of the workpiece, said impact tool means including

an oscillating reciprocatory cutting tool, and

mounting means for supporting said impact tool means on said milling assembly for movement between an operating position in which said cutting tool can contact the workpiece and a rest position, said cutting tool being substantially parallel with the central axis of said milling cutter in said operating position and being angularly separated from said milling cutting by an angle of about 90° in said rest position.

4,203,184

BEARINGS

Stuart A. B. Gray, Kilmarnock, Scotland, assignor to The Glacier Metal Company Limited, Middlesex, England

Filed Jul. 28, 1978, Ser. No. 928,966

Int. Cl.[2] B21D *53/10*

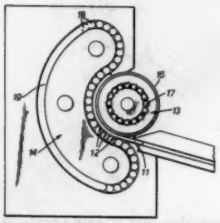
U.S. Cl. 29—149.5 DP **2 Claims**

1. A method of forming a partly-cylindrical bearing in a device utilizing a plurality of small rollers, a relatively large roller and a backing member having a kidney-shaped track formed therein which comprises:

spacing said plurality of small rollers around said large roller so as to define an arcuate passage therebetween;

positioning said small rollers within said track and adjacent said large roller such that said large roller is concentric with said concave portion of said kidney-shaped track;

feeding a strip of bearing material to said arcuate passage while moving said small rollers and rotating said large roller;



progressively deflecting said strip into an arcuate shape as said strip encounters said small rollers;

removing from said arcuate passage a length of said formed strip; and

pressing said formed strip to form a finished partly-cylindrical bearing.

4,203,185

METHOD OF SEALING TUBE PLATE APERTURES, AND REPAIR SET FOR USE THEREIN

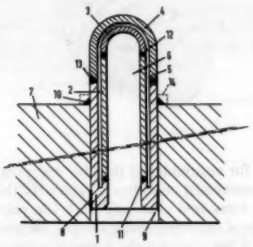
Nico H. H. Beyer, Heemstede; Johannes H. Huigen, Nootdorp, and Johan K. van Westenbrugge, Schiedam, all of Netherlands, assignors to B.V. Neratoom, The Hague, Netherlands

Filed Feb. 27, 1978, Ser. No. 881,716

Claims priority, application Netherlands, Mar. 11, 1977, 7702668

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 C **5 Claims**



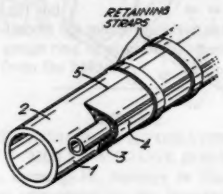
1. In a method of sealing an aperture through a tube plate of a heat exchanger, the tubeplate having a tube side and an accessible side, said method including sealingly installing one end of a tube member into the aperture from the accessible side of the tube plate, the other end of the tube member extending outwardly from the accessible side, and securing a sealing cap to said other end of the tube member, the improvement wherein the step of sealingly installing a tube member comprises: sealingly installing a double-walled tube member having concentric, spaced apart inner and outer tubes joined at the one end of the tube member, and the step of securing a sealing cap to the other end of the tube member comprises securing a first sealing cap to the other end of the inner tube and then securing a second sealing cap to the other end of the outer tube, so as to produce a sealing tube member having an annular thermally insulating space between the interior of the inner tube member and the outer tube member.

4,203,186

HEAT TRANSFER

Ian M. Horner, Southampton, England, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 657,571, Feb. 12, 1976, Pat. No. 4,123,837.
This application Jul. 31, 1978, Ser. No. 929,807
Claims priority, application United Kingdom, Feb. 7, 1975, 5305/75
Int. Cl.[2] B21D *53/00*; B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157.3 R 1 Claim



1. A method of enhancing heat transfer between a heating or cooling element and a conduit or vessel, comprising the following steps in sequence: applying heat transfer cement material in a mouldable state on a surface of the conduit or vessel; pressing at least part of the heating or cooling element towards the said surface so that the said part of the element is at least partly embedded in the heat transfer cement material and the heat transfer cement material is continuous between at least a portion of the part of the element and the surface; applying additional heat transfer cement material in contact with and around the part of the element so that all the surface of said part, other than any surface which contacts the conduit or vessel, is contacted and surrounded by heat transfer cement material; applying the relatively rigid recessed retaining member around the heat transfer cement material so that edges of the retaining member substantially abut the conduit or vessel whereby coherence takes place between said conduit or vessel, said heating or cooling element and said retaining member, and said member maintains said coherence and slight compression of the heat transfer cement material enclosed in the volume defined between the retaining member and the conduit or vessel; and securing the retaining member and conduit or vessel relative to each other to maintain said coherence and slight compression.

4,203,187

FASTENER APPLYING TOOL

William L. Grube, Lake Bluff, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

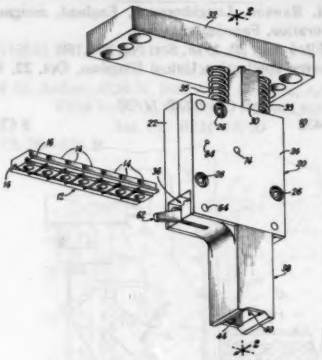
Filed Jun. 15, 1978, Ser. No. 915,721
Int. Cl.[2] B23Q *1/00*
U.S. Cl. 29—283.5 20 Claims

1. A tool for applying fasteners such as pierce nuts and the like into a workpiece comprising

a housing,

a punch reciprocally mounted in said housing for punching said fasteners from a strip into a workpiece, said punch including an elongated slot, and

a feed plate slideably mounted in said housing for advancing said pierce nuts to be engaged by said punch, said plate passing through said slot to remove any fasteners adhering to said punch upon return of said punch from engagement with said fastener.



4,203,188

METHOD OF PRODUCING WELDING WIRE CONSTITUTED BY A CORE OF WELDING POWDER ENCLOSED BY A MANTLE OF METAL

Jacques Blanpain, Gentbrugge, and Leon Delehouzee, Wondelgem, both of Belgium, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed, Luxembourg, Luxembourg

Division of Ser. No. 823,460, Aug. 10, 1977, Pat. No. 4,137,446, which is a continuation-in-part of Ser. No. 572,636, Apr. 29, 1975, Pat. No. 4,048,705. This application Jun. 12, 1978, Ser. No. 914,984
Claims priority, application France, May 22, 1974, 74 17830
Int. Cl.[2] B22F *3/24*; B23K *35/02*; B23P *17/00*
U.S. Cl. 29—420 11 Claims

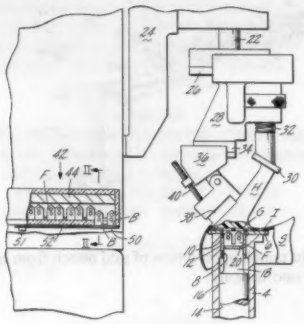
1. A method of producing a welding wire constituted by a core of welding powder enclosed by a mantle of metal, comprising the steps of forming an elongated upwardly open channel composed of an outer metal channel of substantially U-shaped cross-section having lateral flanks of predetermined height and upper edges extending in longitudinal direction of the channel and an inner metal channel of substantially U-shaped cross-section abutting with the outer surface thereof against the inner surface of the outer channel and having lateral flanks of a height about half of said predetermined height and upper edges parallel to said upper edges of said outer channel; introducing into said inner channel a stream of welding powder to fill said inner channel with a loose strand of said powder; covering the loose strand of powder introduced into said inner channel by a metal band having downwardly curved borders engaging the flange of said inner channel to thereby enclose said powder by said inner channel and said metal band; and closing the outer channel by bringing the upper edges thereof in abutment with each other.

4,203,189

METHOD AND MECHANISM FOR APPLYING THERMOPLASTIC HEELS TO SHOES

Francis F. H. Rawson, Loughborough, England, assignor to USM Corporation, Farmington, Conn.

Filed Apr. 20, 1978, Ser. No. 898,180
Claims priority, application United Kingdom, Oct. 22, 1977, 44052/77
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 5 Claims



1. The method of attaching a heel formed of thermoplastic material to a shoe having an insole and a reinforceing shank, which method comprises:

heating a fastener which has a head and at least two shank portions each of which has at least one hole therethrough to a temperature above the softening point of the thermoplastic material of the heel;

positioning the heel and the shoe for attachment;

and then inserting the fastener into the material of the heel so that its shank portions extend through the insole, one on each side of the reinforcing shank of the shoe, at least a portion of the thermoplastic material being softened by heat from the fastener to allow the shank portions to enter the material and become embedded therein with thermoplastic material extending into the holes in the shank portions.

4,203,190

METHOD FOR CONNECTING SEWER PIPES TO MANHOLES

Lowell D. Temple, 2415 Meyer Rd., Fort Wayne, Ind. 46803, and Richard L. Williams, 9180 Parker Rd., Harrod, Ohio 45850

Filed Jun. 15, 1978, Ser. No. 915,770
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—451 7 Claims

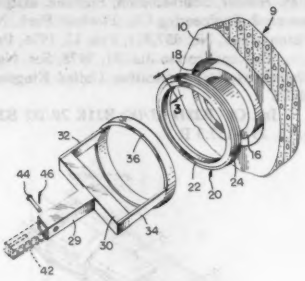
1. The method of connecting a pipe to a manhole or the like comprising:

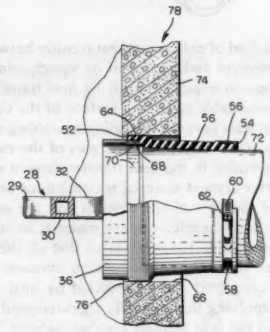
inserting one end of the pipe into an opening in the manhole, said opening having a diameter greater than the outer diameter of the end of the pipe, said manhole having a wall opposite the opening,

providing an annular elastomeric gasket having an inner diameter approximately equal to the outer diameter of the end of the pipe, said gasket including a face normal to the axis of the gasket,

positioning the gasket over the end of the pipe that is within the manhole opening,

bracing an extensible jack against the wall of the manhole opposite the opening and extending the jack to engage the face of the gasket and to exert force thereon in a direction parallel to the axis of the pipe so as to press the gasket simultaneously over the end of the pipe and into the opening to a position concentric with the pipe and opening,





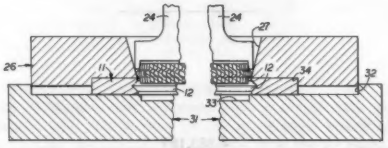
said gasket being tightly compressed between the pipe and opening.

4,203,191

PROCESS AND APPARATUS FOR ASSEMBLING SPIRAL WOUND GASKETS INTO GAUGE RINGS

Vernon W. Gibson, Sr., Birmingham, Ala., assignor to SEPCO Corporation, Birmingham, Ala.

Filed Aug. 31, 1978, Ser. No. 938,655
Int. Cl.[2] B23P *11/02, 19/02*
U.S. Cl. 29—451 6 Claims



1. The process of assemblying a spiral wound gasket of the king embodying a metal strip having a longitudinal channel forming a circumferential, outwardly projecting bead, into the opening of a gauge ring comprising:

(a) simultaneously exerting forces about the outer periphery of the bead and on an outer area of the gasket axially displaced from the bead which reduce the external diameter of the gasket sufficiently for the same to be placed into the opening in the gauge ring, and

(b) removing the forces acting on the bead of said gasket prior to removing the forces on the area displaced from the bead, whereby the bead portion of the gasket may be

placed at least partly in the gauge ring opening while the gasket is still held in reduced diameter condition.

3. In apparatus for assemblying a spiral wound gasket into the opening of a gauge ring comprising,

(a) a holder having a conical shaped passage therethrough, the major and minor diameters of which passage are respectively larger than the gasket in released condition and smaller than the opening in the gauge ring,

(b) a mandrel disposed to engage the gasket about a portion of the axial extent of its exterior circumference and push it through the holder and out of the minor diameter end of said passage, and

(c) means adjacent the minor diameter end of the passage to hold the gauge ring in position to receive the gasket as it emerges from the holder.

4,203,192

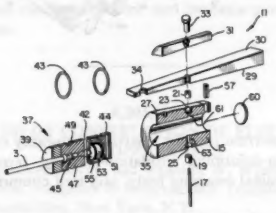
METHOD OF ANCHORING A VIBRATING WIRE INTO A HOLLOW GAUGE BODY

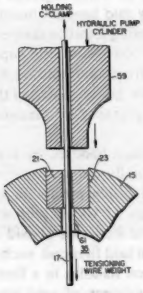
Ivor Hawkes, Lyme, N.H., assignor to The United States of Americas as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 502,265, Sep. 3, 1974, Pat. No. 4,159,641. This application Oct. 23, 1978, Ser. No. 953,394

Int. Cl.² B21D *39/00*

U.S. Cl. 29—452 **6 Claims**





1. A method of anchoring a vibrating wire into a hollow gauge body comprising the steps of:

inserting the wire into two aligned countersunk holes in and through the gauge body;

tensioning the wire;

placing an anchoring tube over one end of the wire on the outside of the gauge body;

punching the tube into one hole of the gauge body against an end wall of the countersunk portion to extrude the tube over the wire and into the sides of the hole;

placing a second anchoring tube over the other outside end of the wire in the other hole; and

punching the second tube into its second hole against an end wall of the countersunk portion such that it is extruded over the wire and into the hole until a desired wire tension is reached.

4,203,193

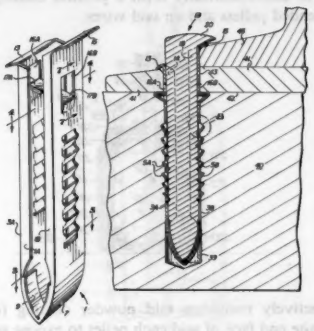
METHOD OF ATTACHING A RAIL AND A TIE PLATE TO A CROSS TIE

David M. Arthur, 4020 N. 14th Ave., Phoenix, Ariz. 85013

Filed Nov. 15, 1978, Ser. No. 960,961

Int. Cl.² B23P *19/00*

U.S. Cl. 29—526 R **4 Claims**



1. A method of attaching a rail and a tie plate to a cross tie, the rail having a flanged base, the tie plate having an aperture therein, the cross tie having a hole therein, said method comprising the steps of:

a. aligning the aperture in the tie plate with the hole in the cross tie and the flanged base of the rail;

b. inserting a spike retainer having a flange through the aperture of the tie plate and into the hole in the cross tie by means of a removable insertion tool until the flange engages the flanged base of the rail;

c. removing the insertion tool from the spike retainer;

d. inserting a spike having an enlarged head into the spike retainer;

e. engaging the tie plate with the spike retainer to prevent substantial upward movement of the spike retainer with respect to the tie plate by means of a wedge-like element extending from the spike retainer;

f. engaging the spike with the cross tie by

i. deformably engaging the spike with the spike retainer to resiliently resist removal of the spike from the spike retainer; and

ii. deformably engaging the spike retainer with the cross tie to resiliently resist removal of the spike retainer from the cross tie;

g. inserting the spike into the spike retainer until the enlarged head of the spike engages the flange of the spike retainer to force the flange of the spike retainer against the flanged base of the rail, and clamp the tie plate and the flanged base of the rail together between the flange and the wedge-like element.

4,203,194

BATCH METHOD FOR MAKING SOLID-ELECTROLYTE CAPACITORS

N. Christian McGrath, Strafford, N.H., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jul. 17, 1978, Ser. No. 925,127

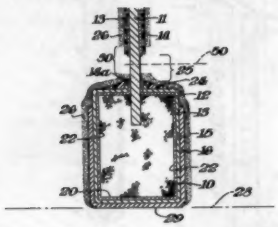
Int. Cl.² B01J *17/00*

U.S. Cl. 29—570 **13 Claims**

1. A batch method for making solid-electrolyte capacitors including providing a plurality of porous valve-metal pellets each having one end face from which a wire of said valve-metal extends, an opposite end face and at least one side face being contiguous with said two end faces; suspending said

pellets by their respective wires from a holding bar; anodically forming an oxide film over the surfaces of each said porous pellet; disposing a solid electrolyte over said film of said each pellet; and depositing a conductive counterelectrode layer overlying said solid electrolyte of said each pellet in a region over said at least one side face and extending over said opposite end face thereof; wherein the improvement comprises:

(a) bringing said suspended pellets to a fluidized bed of a fusible insulative resin powder and applying a high d.c. voltage to said holding bar with respect to said fluidized bed to electrostatically form a powder coating on said suspended pellets and on said wires;



(b) selectively removing said powder coating from said opposite end face of said each pellet to expose said counterelectrode layer;

(c) heating said suspended pellets to fuse and cure the remaining portions of said powder coatings;

(d) subsequently forming an anode terminal over said one end face of each said pellet in contact with the corresponding of said wires, and forming a cathode terminal spaced from said anode terminal over said opposite end face of each said pellet in contact with said counterelectrode; and

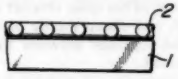
(e) severing said wires to separate said pellets from said bar.

4,203,195

METHOD OF PRODUCTION OF VIBRATION ABSORBING METALLIC MATERIAL

Hideo Nakae, Kashiwa; Toshinori Ozaki, Minorimachi; Kazunori Nakane, Tokaimura, and Takashi Shimaguchi, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1977, Ser. No. 862,623
Claims priority, application Japan, Oct. 21, 1977, 52-125739
Int. Cl.[2] B21D *39/00*; B23P *11/00*
U.S. Cl. 29—505 **5 Claims**



1. A method of production of vibration absorbing metallic material comprising the steps of:

placing at least one layer of wire netting over at least one layer of a metallic raw material in plate form in vertically stacked relation, wherein said metallic raw material is an ordinary structural rolled steel; and

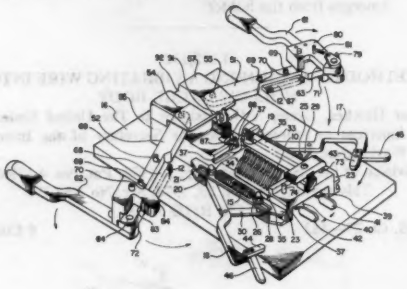
subjecting the stack of wire netting and metallic raw material to rolling, thereby forming friction interfaces between said metallic raw material and said wire netting or within the wire netting, whereby a vibration absorbing material having a vibration damping capacity larger than said metallic raw material is formed.

4,203,196

WIRE INSERTION TOOL

Hiroyuki Fukushima; Minoru Yoshida, both of Tokyo, and Hiromasa Inoue, Musashino, all of Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 790,629, Apr. 25, 1977, abandoned.
This application May 25, 1978, Ser. No. 909,581
Claims priority, application Japan, Jun. 4, 1976, 51-052425
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.3 **12 Claims**



1. A wire insertion tool for inserting a plurality of wires in respective non-deforming insulation-piercing terminals retained in a terminal retaining body, said tool comprising:

a base;

terminal retaining body support means connected to said base for releasably supporting a terminal retaining body in a fixed position on said base;

wire holding means connected to said base for releasably holding a plurality of wires adjacent a terminal retaining body supported by said support means;

first and second releasing handles cooperating to release the terminal retaining body from said support means and the plurality of wires from said holding means;

wire guiding means for guiding each of the plurality of wires toward one of a plurality of terminals in the terminal retaining body;

first and second insertion handles, each of said handles having a first end pivotally connected to said base;

a plurality of wire insertion means for engaging respective ones of the plurality of wires, said wire insertion means being mounted on at least one of said insertion handles at a point remote from said first end, such that relative movement of said inserton handles in a first direction effects a corresponding movement of said plurality of insertion means and insertion of each of the wires in a respective terminal;

means for prohibiting movement of said insertion handles in a direction counter to said first direction during engagement of said insertion means with said wires until said wires are completely inserted within said terminals;

cutting means adjacent said guiding means and cooperating with said insertion means for cutting each of the wires at a predetermined point; and

wherein said first and second releasing handles are mounted such that relative movement of said releasing handles in a first direction effects the substantially simultaneous release of said terminal retaining body from said support means and of the plurality of wires from said holding means.

4,203,197

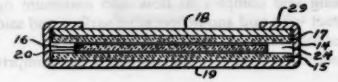
METHOD FOR MAKING A CERAMIC BOND HEATER

Walter R. Crandell, Addison, Ill., assignor to Fast Heat Element Mfg. Co., Inc., Elmhurst, Ill.

Continuation of Ser. No. 668,292, Mar. 18, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,169

Int. Cl.[2] H05B 3/00

U.S. Cl. 29—611 7 Claims



1. In a method for fabricating a unitary electric ceramic band heater comprising the steps of assembling resistance wire on an uncured sheet of ceramic particles impregnated to a high density and bound together in heat dissipatable binder material, arranging said assembled wire and uncured sheet between uncured sheets of insulator particles bound together in heat dissipatable binder material, compressing said arranged assembled wire and uncured sheet and said uncured insulator sheets together to substantially eliminate air voids between said sheets, and heating said compressed arranged assembly at a temperature sufficient to substantially dissipate said binder materials and cure said ceramic and insulator particles into an integral mass.

4,203,198

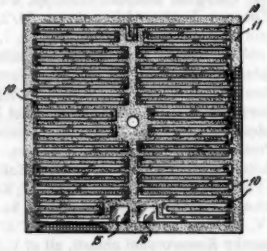
METHOD OF CONSTRUCTION OF ELECTRICAL HEATING PANELS

Barrie H. Hackett, Gray, and Rudolph W. Wissley, Portland, both of Me., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 965,754

Int. Cl.[2] H05B 3/36

U.S. Cl. 29—611 12 Claims



1. The method of making an electricl heating panel, comprising the steps of:

silk screening at least one resistive array pattern on a given surface of a thin metallic foil, curtain coating the other surface of said foil with a polymer compound, etching said screened array to remove all foil not within said pattern to form a resistive foil array, positioning a first sheet of fiber glass cloth over said given surface of said array to form a composite structure, placing said structure in a magnetic field while stripping said polymer coating from said array, placing a second sheet of fiber glass on said other surface which contained said polymer coating, binding said array between said first and second sheets by applying a binder including colloidal silica spheres, to form a composite heating panel structure.

4,203,199

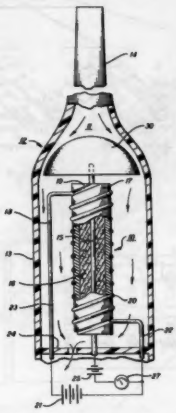
SOLID STATE SENSOR

Michael J. Morgan, Syracuse, N.Y., assignor to Inficon Leybold-Heraeus, Inc., East Syracuse, N.Y.

Division of Ser. No. 841,285, Oct. 12, 1977, Pat. No. 4,171,341. This application Oct. 2, 1978, Ser. No. 947,824

Int. Cl.[2] H01C 7/02

U.S. Cl. 29—612 6 Claims



1. The method of forming a solid state sensing device for detecting the presence of given gases and vapors in an atmosphere including

providing a hollow ion shield formed of a material that is deplete in alkali metal ions,

centering an elongated electrode along the axis of the shield,

packing a granulated reactive material of an alkali metal compound into the shield under sufficient pressure to hold the material tightly between the electrode and the inner wall of the shield.

4,203,200

METHOD AND APPARATUS FOR MAKING AN ENCAPSULATED PLUG-IN BLADE FUSE

Gerald L. Wiebe, 18 W. 077 Williamsburg La., Villa Park, Ill. 60181

Continuation-in-part of Ser. No. 922,151, Jul. 7, 1978, Pat. No. 4,164,726, which is a continuation-in-part of Ser. No. 820,555, Aug. 1, 1977, Pat. No. 4,164,725. This application Nov. 2, 1978, Ser. No. 957,137

Int. Cl.[2] H01H 69/02

U.S. Cl. 29—623 20 Claims

1. The method of making an encapsulated, three-piece solderless plug-in fuse comprising the steps of:

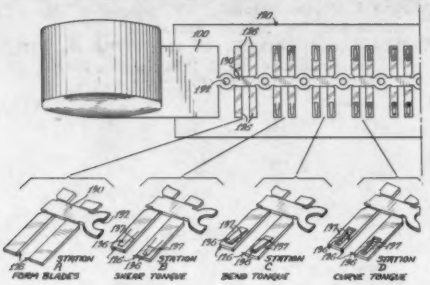
providing a pair of blades, each blade having at one end a terminal portion for being connected into an electrical circuit and at the other end a fusible link support spring clip;

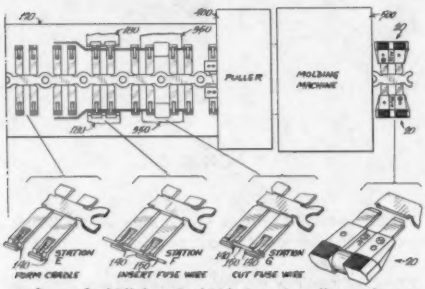
arranging said blades in spaced-apart, generally parallel relationship;

inserting a fusible link into the spring clip of each of said pair of blades; and

encapsulating said fusible link and the fusible link support

spring clip of each of said blades with a solid unitary body of electrically insulating material so that the external





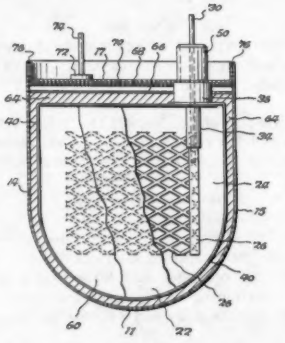
surfaces of said link and said blade spring clip portions are in intimate contact with said material.

4,203,201

METHODS FOR MAKING LITHIUM-IODINE CELL

Ralph T. Mead, Kenmore; Wilson Greatbatch, Clarence; Frank W. Rudolph, Depew, and Norbert W. Frenz, Jr., North Tonawanda, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Division of Ser. No. 812,641, Jul. 5, 1977, Pat. No. 4,128,703.
This application Jul. 5, 1978, Ser. No. 921,905
Int. Cl.[2] H01M *6/18*
U.S. Cl. 29—623.1 **11 Claims**



1. A method of making a lithium-iodine cell comprising the steps of:

a. providing a casing of electrically conducting material having an inner surface;

b. providing a lithium anode having an operative surface;

c. providing a solid element comprising a charge transfer complex of an organic electron donor material and iodine having a predetermined shape to fit relatively closely between said lithium anode operative surface and said casing inner surface;

d. placing said solid element in operative association with a lithium anode in said casing; and

e. heating said element while in said casing to a temperature causing said complex to flow into maximum operative contact with said anode operative surface and said casing inner surface.

7. A method of making a lithium-iodine cell comprising the steps of:

a. providing a casing of electrically conducting material having an inner surface and having an opening at one end thereof;

b. providing a subassembly comprising the combination of a lithium anode assembly having an anode operative surface and a lid of electrically conducting material mechanically connected to said anode assembly and electrically insulated thereform;

c. preparing cathode material by heating a mixture of iodine and an organic electron donor material to a temperature greater than the crystallization temperature of said iodine;

d. pouring said heated cathode material into said casing through said opening so as to contact said inner surface;

e. placing said subassembly including said lithium anode into said casing through said opening in a manner such that said anode operative surface is contacted by said heated cathode material and simultaneously placing said lid in said opening of said casing as said lithium anode is placed into said casing to be contacted by said heated cathode material; and

f. sealing the opening in said casing by welding said lid to said casing around the periphery of said lid.

4,203,202

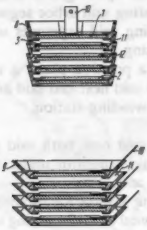
METHOD OF MAKING STANDBY PRIMARY CURRENT SOURCES

Levon P. Esaian, prospekt Mira, 182, korpus 3, kv. 9, Moscow; Valery S. Sokolov, ulitsa Ordzhonikidze, 55/39, kv. 24, Kalinin; Dina V. Kurygina, prospekt Mira, 99, kv. 39, Moscow; Fedor F. Zubanov, Leningradskoe shosse, 54/2, kv. 26, Kalinin; Valentin N. Aleshin, ulitsa Fabrichnaya, 7, kv. 32, Moskovskaya oblast, poselok Pravdinsky; Gennady V. Bolshov, ulitsa Bogdanova, 24-a, kv. 21, Kalinin; Igor S. Kuzyko, Yaroslavskoe shosse, 67, kv. 83, Moscow; Oleg A. Fedotov, ulitsa Tomary Ilinoi, 7, kv. 43, Kalinin; Ninel K. Belysheva, ulitsa Akademika Komarova, 13, kv. 52, Moscow; Alexei M. Anosov, Proletarskaya naberezhnaya, 11, kv. 196, Kalinin; Alexei I. Antonov, ulitsa Erofeeva, 8, kv. 4, Kalinin; Viktor I. Terentiev, Volokolamsky prospekt, 43, kv. 17, Kalinin; Viktor A. Naumenko, ulitsa Novo-Alexeevskaya, 48, kv. 12, Moscow, and Boris V. Akimov, prospekt Lenina, 75 "A", kv. 30, Leninsk-Kuznetsky Kemerovskoi oblasti, all of U.S.S.R.

Filed Feb. 23, 1978, Ser. No. 880,497
Int. Cl.[2] H01M *6/44*
U.S. Cl. 29—623.2 **2 Claims**

1. A method of producing standby water-activated primary current sources, comprising the steps of: hermetically sealing, with a water-repellent insulant, ends and edges of each of a plurality of negative electrodes forming part of a bipolar electrode; shaping a flanged rim along the perimeter of each of said negative electrodes concurrently with said hermetical sealing of said ends and edges of each of said negative electrodes, said flanged rim forming a continuous inclined surface with respect to the electrode surface and its height exceeding the thickness of the bipolar electrode and of a separator; forming at least one inclined shoulder on the flanged rim for passage of water and gases and for current leadout, concurrently with said shaping of said flanged rim, said inclined shoulder being formed at an angle different from the angle of inclination of the flange rim;

providing current leadouts on at least two electrodes; interlaying said bipolar electrodes with separators in such a way that the negative part of one bipolar electrode is insulated with the separator from the positive part of an adjacent bipolar electrode; stacking said bipolor electrodes such that the inclined



surfaces of the flanged rims of adjacent bipolar electrodes are in contacting relationship; welding together the adjoining surfaces of the flanged rims into an integral block of bipolar electrodes, said welding occuring along opposed inclined surfaces of the flanged rims.

4,203,203

ELECTRICAL CONNECTOR AND METHOD OF MANUFACTURE

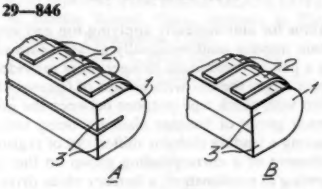
Hermanus P. J. Gilissen, Esch; Petrus R. M. van Dijk, and Ludovicus C. van der Sanden, both of 's-Hertogenbosch, all of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 20, 1978, Ser. No. 944,212

Claims priority, application United Kingdom, Sep. 24, 1977, 39854/77

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—846 **3 Claims**



1. A method of forming a connector for use between printed circuit boards or the like and having spaced contact portions at opposed surfaces of an elastomeric body, the contact portions on the opposed surfaces being interconnected by conductive paths, the method comprising the steps of;

a. forming conductive paths on one surface on a lamina of elastomeric material;

b. folding the lamina in generally U-shaped fashion to bring the other surface of the lamina into abutting engagement and with the conductive paths extending along the distal surfaces and around the fold, the portion of the paths between the fold and ends of the lamina providing flat portions adapted to be contacted by the printed circuit boards or the like; and

c. bonding the abutting surfaces together.

4,203,204

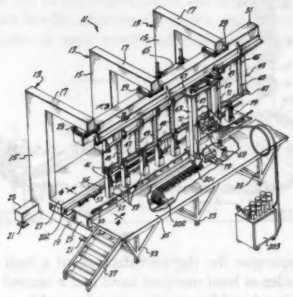
APPARATUS FOR THE AUTOMATED ASSEMBLY OF MAJOR SUBASSEMBLIES

Richard J. Murphy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 2, 1979, Ser. No. 915

Int. Cl.[2] B23P *11/00, 21/00*

U.S. Cl. 29—703 **29 Claims**



1. An automated assembly machine for major subassemblies comprising:

(a) support means for supporting the components of a major subassembly in a predetermined location;

(b) first and second carriage mechanisms mounted on said support means so as to be located on opposite sides of the components of a major subassembly supported by said support means, each of said first and second carriage mechanisms comprising:

(1) a main carriage movable in a predetermined plane adjacent to said predetermined location;

(2) a secondary carriage mounted on said main carriage for movement toward and away from said location and generally perpendicular to said predetermined plane, said secondary carriages including an apertured projection, said apertured projections positioned so as to face one another;

(3) a shuttle carriage mounted on said secondary carriage for aligning drilling-fastening tools mounted on said shuttle carriage with said apertured projection;

(4) drilling-fastening tools; and,

(5) mounting means for mounting said drilling-fastening tools on said shuttle carriage for movement toward and away from the aperture in said apertured projection; and,

(c) control means connected to said first and second carriage mechanisms for:

(1) positioning said main carriages such that said apertured projections are aligned with one another where a fastener is to be installed;

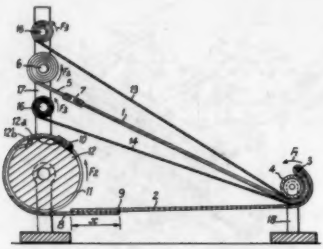
(2) moving said secondary carriages toward one another so that the components of said major subassembly where a fastener is to be installed are clamped together by said apertured projections; and,

(3) controlling said shuttle carriages, said mounting means and said drilling-fastening tools such that a fastener is installed in said components by sequentially moving said drilling-fastening tools into positions aligned with the aperture in said apertured projection, moving said tools toward and away from said aperture in said apertured projection; and, powering said tools as required.

4,203,205
METHOD AND APPARATUS FOR THE MANUFACTURE OF A HEAT EXCHANGER

Etienne Jouet, Lamorlaye, France, assignor to Spirec l'Echangeur Spirale Ever Clean, Paris, France

Filed Dec. 27, 1977, Ser. No. 864,796
Claims priority, application France, Dec. 27, 1976, 76 39149
Int. Cl.[2] B23P 15/26
U.S. Cl. 29—727 8 Claims



1. An apparatus for the manufacture of a heat exchanger which includes at least one first band and a second band fixed to said first band and forming a casing for said heat exchanger, said apparatus comprising a frame upon which is mounted a mechanism including:

a means for winding said bands into a spiral, said means having an axis and being driven by a motor;

an unwinding device in the form of a drum having an axis which is parallel to that of said means for winding;

at least one elongated windable member fixed at one end to said drum and removably fixed at another end to one end of said second band and adapted to connect said drum with said second band;

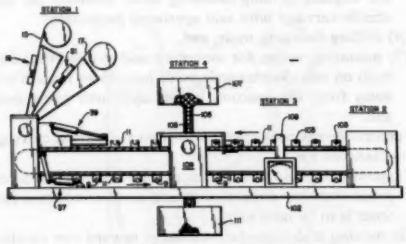
a second motor for rotating said drum; and

an adjustable braking device acting on said drum.

4,203,206
ASSEMBLY MACHINE

Jesse L. Morris, Archer, and Raymond K. Sugalski, Gainesville, both of Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Mar. 31, 1977, Ser. No. 783,087
Int. Cl.[2] H01M 2/10
U.S. Cl. 29—731 13 Claims



1. A machine for winding strip plate and separator materials into a coil and for assembling the coiled materials into a container comprising:

(a) a coil winding station,

(b) transport means including a conveyor and a plurality of nests fixed to said conveyor and sequentially positionable at said winding station, each nest having a cylindrical opening oriented transverse to the direction of motion of said conveyor,

(c) means for sequentially advancing said conveyor to position said nests, one after the other, at said coil winding station,

(d) an arbor having two segments oriented parallel to the longitudinal axis of said nest opening and mounted for reciprocal movement along said longitudinal axis from the opposite ends of said nest opening for insertion into said nest opening when the nest opening is at said winding station,

(e) means for reciprocating said arbor segments and means for synchronously rotating said segments when said segments are in said nest opening,

(f) means for feeding a positive plate, a negative plate, and separator material to said nest and said arbor when said nest is positioned at said winding station,

(g) a canning station,

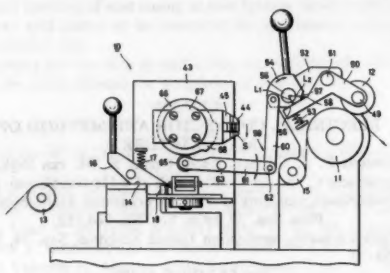
(h) means for moving said nest with said positive plate, said negative plate and said separator material coiled therein to said canning station, and

(i) means at said canning station for moving a coiled roll unit from said nest positioned at said canning station into a can in said canning station.

4,203,207
APPARATUS FOR AUTOMATICALLY APPLYING TOP END STOPS TO A SLIDE FASTENER CHAIN

Yoshio Oyama, Asahi, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 28, 1978, Ser. No. 946,547
Claims priority, application Japan, Oct. 6, 1977, 52-120295
Int. Cl.[2] B21D 53/52
U.S. Cl. 29—767 4 Claims



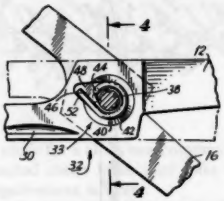
1. Apparatus for automatically applying top end stops on a fastener chain moving unidirectionally along a path of travel and having a pair of continuous stringer tapes provided along opposed inner edges thereof with groups of fastener elements and provided with blank tape portions between the groups of elements, each group of fastener elements being interlocked with and having a leading element shifted out of registry with a leading element of a corresponding group on the opposite tape, comprising in combination: a fastener chain drive operable to drive the fastener chain unidirectionally along said path and comprising a feed roller and a pinch roller normally urged into engagement with said feed roller; means for stopping corresponding pairs of blank tape portions at a predetermined position in said path of travel; a pair of tape grippers provided in said position one on each side of said path of tape travel, each gripper being adapted to grip the respective stringer tape and to spread said tapes apart along a limited region; a top stop carrier mounted above said predetermined position for arcuate movement into and out of said path in the region where the tapes are spread by said tape grippers for delivering and clamping top end stops onto the fastener chain; and means responsive to said arcuate movement of said top stop carrier in timed relation therewith for bringing said pinch roller into and out of engagement with said feed roller so as to allow said opposite leading elements to be brought closely adjacent to said top end stops being delivered by said top end stop carrier while said fastener chain is released from said fastener chain drive.

4,203,208

BIASED POCKET KNIFE SCISSORS

Jay Tausendfreundt, Portsmouth, and Albert Gentile, Warwick, both of R.I., assignors to Imperial Knife Associated Companies, Inc., New York, N.Y.

Filed Feb. 14, 1979, Ser. No. 11,810
Int. Cl.[2] B26B *13/16*
U.S. Cl. 30—155 6 Claims



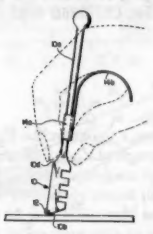
1. A scissors biased to an open position by a concealed spring means which comprises a first rectilinear blade, a second rectilinear blade, pivot means, said first blade being pivotally secured to said second blade at a point intermediate the ends of said blades by said pivot means, and means for biasing said blades to open position in which said blades are at an acute angle to one another, said biasing means including a spring means mounted about said pivot means, said spring means comprising a single flat coil which spans an arc of slightly less than 360°, one end of said coil having an integral leg substantially perpendicular to the plane of the coil, said leg being parallel to and adjacent said pivot means, the other end of said coil extending tangentially away from the arc of the spring means, one of said blades having a pocket adjacent said pivot means, said pocket including an extension, the other of said blades having a pocket adjacent said pivot means, said leg being located in said second named pocket, said spring means being disposed in said pockets with the coil of said spring means extending about said pivot means, and the other end of said coil in conjunction with said leg biasing said blades to said open position, said other end of said coil bearing against a side of the extension in said first named pocket.

4,203,209

ATTACHMENT FOR HAND GLASS CUTTER

Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.

Filed Jan. 8, 1979, Ser. No. 1,917
Int. Cl.[2] C03B *33/10*
U.S. Cl. 30—164.95 4 Claims



1. An attachment for use with a glass cutter of the type having an upwardly extending handle with a flattened lower finger engageable portion of generally tapered rectangular cross section, which lower handle portion is so tapered that the wider cross section is toward the lower end of the handle, said attachment comprising a one-piece formed member having a lower sleeve defining portion with side walls defining a tapered sleeve opening to snugly receive said tapered handle portion, said tapered sleeve opening having a front side which is open and defined only by flanges integrally formed on said side walls to define a front opening to receive the smaller upper end of the handle during assembly, said one-piece member having an upwardly extending portion formed by an integral extension of a rear side of said sleeve defining portion, and said upwardly extending portion having a cantilevered free end portion curving away from the handle to which said member is adapted to be attached, said curving free end portion shaped to contact the palm of a user gripping the glass cutter in such a manner that one of his fingers abuts the wider cross sectional portion of the handle adjacent the lower end thereof whereby the glass cutter is more comfortable and secure in his hand during use.

4,203,210

SHINGLE STRIPPER

Paul E. Hadlick, Jr., 11527 Monticello Ave., Silver Spring, Md. 20902

Filed Oct. 12, 1978, Ser. No. 950,557
Int. Cl.[2] A47L *13/02*
U.S. Cl. 30—172 10 Claims

1. A roof stripping tool, comprising:

a blade, including a forward flat section and a rear section of approximately equal length forming an interior angle of greater than 0 degrees but less than 45 degrees with the plane of said forward section;

said forward section of said blade including a plurality of nail shank engaging "V" shaped grooves across the front edge thereof; and

a fulcrum means secured to the underside of said rear section of said blade, said fulcrum means spanning approximately the total width of said rear section of said blade and extending down from said rear section of said blade to meet but not pass the plane of said forward section for positioning said forward section parallel to the roof plane.

4,203,211

FAUCET STEM NUT SPLITTER

Thomas R. Quick, 2640 SW. 61, Oklahoma City, Okla. 73159

Filed Oct. 24, 1978, Ser. No. 954,156
Int. Cl.[2] B26B *7/00*
U.S. Cl. 30—272 R 5 Claims

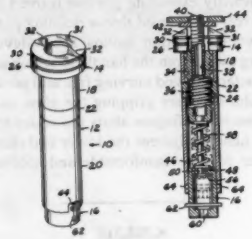
1. A nut splitting tool for splitting a faucet nut surrounding an intermediate portion of a vertically disposed externally threaded tubular faucet stem adjacent a sink flange, comprising:

sleeve means including an outer sleeve having internal threads intermediate its ends and having diametrically opposed J-slots formed in its depending end, and,

an inner sleeve having internal threads engaging said

faucet stem for supporting said tool thereon and having external threads engaging said outer sleeve threads;

blade means interposed between said sleeve means and said faucet nut;



bearing means interposed between said sleeve means and said blade means permitting angular rotation of said sleeve means relative to said blade means; and,

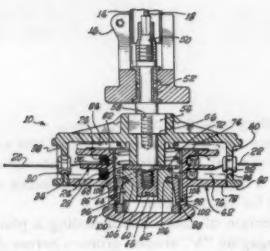
means engageable with the J-slots for angularly rotating said outer sleeve relative to said inner sleeve and the faucet stem and moving said outer sleeve toward said faucet nut.

4,203,212

FLAIL FEEDOUT MECHANISM FOR A ROTARY MOWER

Raymond E. Proulx, 5837 Cameo St., Alta Loma, Calif. 91701

Filed Jul. 13, 1978, Ser. No. 924,234
Int. Cl.[2] A01G *3/06*
U.S. Cl. 30—276 **8 Claims**



1. In a mower having at least one cutting flail which extends outwardly from a spinning assembly including two major assemblies, a cap assembly and a spool assembly having a bumper for engagement with the ground and means to allow predetermined lengths of flail to feed outwardly in response to the striking of the bumper on the ground, the improvement comprising:

a cam member having a serpentinous cam slot therein connected to one of said assemblies,

a follower member connected to the other of said assemblies and having at least one cam follower thereon positioned to ride in said slot, and

bias means acting between said cam member and said follower member tending to urge said cam follower into stable positions on said serpentinous cam slot when undisturbed by force applied to said bumper and adapted to be overcome by suitable force applied to said bumper, said serpentinous cam slot having at least one ramp portion and at least one portion generally parallel to the force applied by said bias means.

4,203,213

KNIFE FOR TABLEWARE AND KITCHEN USE

Francesco Mollica, Varese, Italy, assignor to Mollica S.r.l., Varese, Italy

Filed Jul. 3, 1978, Ser. No. 921,296
Claims priority, application Italy, Feb. 17, 1978, 20391 A/78
Int. Cl.[2] B26B *3/02*
U.S. Cl. 30—343 **7 Claims**

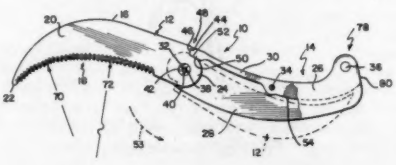
1. A knife comprising an elongate support member made of plastic material and including an elongate handle portion and a substantially flat elongate holding portion aligned and integral therewith, an elongate lamellar element made of metal and extending over a length substantially corresponding to the length of said elongate holding portion, said lamellar element being embedded in said holding portion and having a substantially flat cutting portion projection from said holding portion in a plane substantially parallel to said substantially flat elongate holding portion along one side thereof to define a cutting edge, and means for firmly holding said lamellar element within said elongate holding portion.

4,203,214

KNIFE

James W. Fogle, Indianapolis, Ind., assignor to Saran Industries, Inc., Indianapolis, Ind.

Filed Aug. 7, 1978, Ser. No. 931,298
Int. Cl.[2] B26B *9/02*
U.S. Cl. 30—355 **4 Claims**

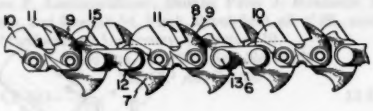


1. A knife having a handle and a blade, said blade including a pair of side surfaces and a cutting surface, said cutting surface including a first continuous cutting edge on one of said side surfaces, and a second cutting edge located between said side surfaces, said second cutting edge being integral with and intersecting said continuous cutting edge, said first and second cutting edges slanting toward said handle.

4,203,215
ENDLESS CHAIN FOR A CHAIN SAW

Hiroyoshi Ochiai, Miyazaki, and Masao Nakamoto, Fukuoka, both of Japan, assignors to Hideaki Taniguchi, Miyazaki, Japan

Filed Jun. 19, 1978, Ser. No. 916,618
Claims priority, application Japan, Jul. 8, 1977, 52-91327[U]
Int. Cl.[2] B27B *17/02, 33/14*
U.S. Cl. 30—383 7 Claims



1. In an endless chain for a chain saw comprising a plurality of pivotally connected cutter links, joint links and sprocket teeth links, the improvement wherein:

(a) the cutter link has a saw adjusting portion forming a first inclined section and a saw tooth portion forming a second inclined section, said saw adjusting portion and said saw tooth portion being integrally joined to form an inclined U-shape construction,

(b) a cutting edge provided at the top of said saw tooth portion,

(c) said saw adjusting portion having a lower edge section, and means defining a recess formed in said lower edge section,

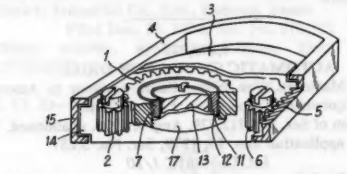
(d) said joint link having a forward and a rear end portion, said rear end portion having a semi-circular configuration,

(e) said cutter link and said joint link being disposed such that said recess in said cutter link engages said semi-circular rear end portion of said joint link to thereby support said cutter link on said joint link.

4,203,216
MAGNETIC PROSTHETIC ELEMENT

Jean-Antoine E. Deguemp, 20 rue de Vintimille, 75009 Paris, France

Filed Jun. 2, 1978, Ser. No. 911,871
Claims priority, application France, Jun. 2, 1977, 77 16822
Int. Cl.[2] A61C *13/00, 13/22*
U.S. Cl. 32—2 7 Claims

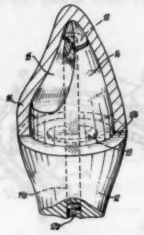


1. A magnetic device for retaining a prosthetic element, in particular, a dental prosthesis, on a bone segment, in particular the jawbone, the device comprising an internal magnetic or magnetizable material, preferably seated in removable manner in a cavity fashioned in said bone, said internal magnetic or magnetizable material interacting with an external magnetic or magnetizable material seated in the prosthesis, a frame rigidly fixed to the prosthesis, a support mounted in said frame and housed within its thickness, said external material being solidly fastened to said support; and means to control, preferably in continuous manner, the relative position of said support in said frame, on one hand in a plane parallel to that of the front face of said material so as to adjust the relative position of the axes of the internal and external materials, and on the other hand in a direction perpendicular to this plane so as to adjust the magnitude of the gap between pole pieces.

4,203,217
ATTACHMENT OF TOOTH CROWNS

Peter F. Kurer, Cheadle, England, assignor to Pinnockchoice Limited, Manchester, England

Filed Aug. 30, 1978, Ser. No. 938,021
Claims priority, application United Kingdom, Sep. 9, 1977, 37690/77
Int. Cl.[2] A61C *5/08*
U.S. Cl. 433—220 3 Claims



1. A method of attaching a tooth crown to a natural tooth root having a prethreaded root canal comprising the steps of:

engaging a threaded post with the previously prepared prethreaded tooth root canal,

locating a plurality of collars screw threadedly engaged with the post axially on the post and in requisite spaced disposition thereon,

tightening one of the collars against the tooth root face,

positioning the other collar outwardly of the tooth root face in spaced relationship with such collar tightened against the tooth root face,

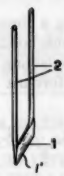
creating an in situ shaped head on the post and the collars, and

securing a crown to the shaped head.

4,203,218
ENDOSSEAL IMPLANT FOR DENTAL PROSTHESIS

Giorgio Dal Pont, Piazza Mazzini 19, 32100 Belluno, Italy

Filed Jun. 9, 1978, Ser. No. 914,181
Claims priority, application Italy, Jun. 10, 1977, 84132 A/77
Int. Cl.[2] A61C *8/80*
U.S. Cl. 433—176 5 Claims



1. An endosseal implant for dental prosthesis which requires no incising and pre-drilling of the gum tissue and jaw bone comprising a unitary surgical round metal wire section having a diameter of about one millimeter including a pair of bendable and trimable substantially parallel and substantially equal length segments, and a flattened chisel-like transverse anchor portion integrally joined to corresponding ends of said parallel segments and having a straight sharpened edge along that side of the anchor portion away from said segments, the anchor portion being formed from the same unitary wire section used to form the parallel segments and being produced solely by

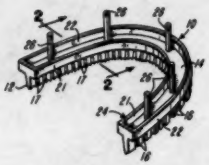
flattening and sharpening such wire section, said anchor portion adapted to be driven by impact into the bone structure forming the alveolar crest.

4,203,219

DENTAL MODEL ASSEMBLY AND PRODUCTION METHOD

Joseph Wiener, Dayton, Ohio, assignor to Carl Dorf, Walnut Creek, Calif.

Filed Aug. 8, 1978, Ser. No. 931,943
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—74 **22 Claims**



1. A die locator for use in making a dental model assembly, comprising an elongated generally U-shaped body of solid material, said body including a longitudinally extending generally U-shaped rib portion having converging opposite side surfaces forming a tapering cross-sectional configuration, said rib portion adapted to project into a molded dental model and being releasable therefrom, said body including means for rigidly connecting said rib portion to a base disposed to support the model, and said rib portion having means for precisely locating individual sections of the dental model after the model is cut into sections and for preventing longitudinal movement of each section on said rib portion.

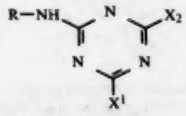
4,203,220

TRIAZINES AND THEIR USE IN BONDING RESINS TO BIOLOGICAL TISSUE

Peter J. Cranfield, London, England, assignor to National Research Development Corporation, London, England

Filed Jul. 8, 1976, Ser. No. 703,660
Claims priority, application United Kingdom, Jul. 9, 1975, 28927/75
Int. Cl.[2] A61K *5/06*
U.S. Cl. 433—228 **12 Claims**

1. A method of bonding a clinically tolerated resin having polymerisable olefinic double bonds to a surface of a biological tissue which comprises contacting the biological tissue with a compound of the general formula



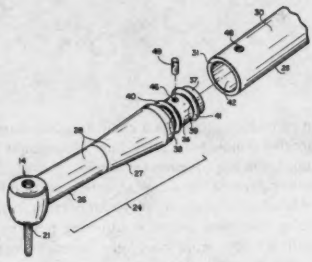
wherein R is an organic group containing a polymerisable olefinic double bond and X^1 and X^2 independently represent F or Cl or Br so as to react at least one of X^1 and X^2 with a reactive group present on the surface of the biological tissue to form a reaction produce containing a group R, contacting the resin with the reaction product and copolymerising the resin with the olefinic double bond in the group R in the reaction product.

4,203,221

GAS-DRIVEN HANDPIECE HAVING VIBRATION ISOLATING MEANS

Arthur A. Knopp, Chalfont; John E. Nash, Downington, and Richard P. Lewis, Springfield, all of Pa., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sep. 29, 1978, Ser. No. 947,214
Int. Cl.[2] A61C *1/10*
U.S. Cl. 433—117 **18 Claims**



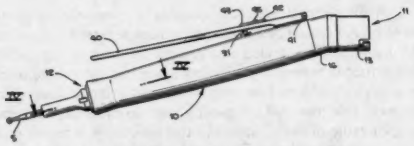
1. A dental handpiece comprising:
a handle portion having a proximal end and a distal end;
a housing for a gas driven motor connected to said handle portion at said distal end;
said handle portion including a first handle member having an outer wall and an end wall and a second handle member having an outer wall and an end wall, said first and second handle members connectable to each other at a junction so as to form a substantially continuous elongated handle portion with said outer walls providing a surface for gripping said handpiece;
means for forming a substantially rigid connection between said first handle member and said second handle member adjacent the junction, when said first and second handle member end walls are in proximate abutting relationship;
said means for forming the substantially rigid connection including resilient means interposed between said first and said second handle members such that said first and second handle members are not in direct contact with each other, said resilient means substantially inhibiting the transfer of vibration between said first and second handle members.

4,203,222

AUTOMATIC CHUCK FOR DRILL

Terry M. Mattchen, Van Nuys, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Continuation of Ser. No. 712,729, Aug. 9, 1976, abandoned. This application Jan. 15, 1979, Ser. No. 3,657
Int. Cl.[2] A61C *1/10*
U.S. Cl. 433—129 **20 Claims**



1. In a surgical tool having a pneumatically driven motor in a motor housing, a source of air under pressure to drive the motor, output means for being rotated by the motor and transmitting it to a rotating implement and securing means for securing the implement to the output means, the improvement comprising the provision of:
the securing means comprising transmission means for re-

ceiving air under pressure from the source of air and for converting the pressure to a force acting on the implement to grip the implement and passage means through the motor housing for directing air from the source of air to the transmission means.

4,203,223

PERIODONTAL PROBE

Eugene P. Lautenschlager, Skokie; Peter J. Robinson, Kenilworth, and Randall M. Vitek, Brookfield, all of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Jan. 12, 1979, Ser. No. 3,130

Int. Cl.[2] A61C *3/00*

U.S. Cl. 433—75 **13 Claims**

1. A periodontal probe comprising an elongated handle having a head end provided with a generally transversely-extending sleeve; a probe shaft slidably supported by said sleeve, said shaft including an elongated tip at one end thereof and bearing means at the opposite end thereof; a leaf spring having one end secured to said handle and an opposite end engaging said bearing means for urging said shaft in one direction to extend said tip away from said sleeve, the force exerted by said spring upon said shaft progressively increasing as said shaft is displaced in a direction opposite from said one direction; stop means for limiting the extent of movement of said shaft in said one direction; and means provided by said shaft and sleeve for indicating when said shaft is retracted to a point at which said spring exerts an extending force of predetermined magnitude upon said shaft.

4,203,224

INSERTION SPACE CHECKING JIG FOR ELECTRONIC COMPONENTS

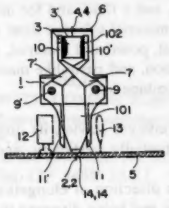
Kazuhiko Narikiyo, Neyagawa; Eiji Itemadani, Sakai, and Yoshinobu Maeda, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 20, 1978, Ser. No. 971,213

Claims priority, application Japan, Dec. 27, 1977, 52/177313[U]

Int. Cl.[2] G01B *5/14*

U.S. Cl. 33—149 R **4 Claims**



1. An insertion space checking jig for electronic components with two parallel lead wires, comprising

a frame having a below extended member with two parallel guide pins on its bottom face with a specified gap between each other and having on its top part a reference plate with two holes with the same gap as the said specified gap for inserting the lead wires therein,

a pair of levers pivotted on said frame in a crosswise relation with each other, upper ends of the levers forming a pair of holding levers for holding the electronic components and lower ends of the levers forming a pair of detection levers, respectively.

4,203,225

POSITION INDICATOR FOR CONTROL MEASUREMENTS OF SURFACES

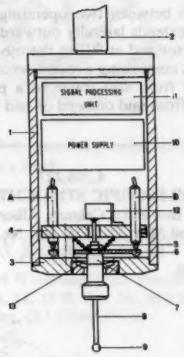
Gunnar Nilsson, Eskilstuna, Sweden, assignor to AB CE Johansson, Eskilstuna, Sweden

Filed Sep. 18, 1978, Ser. No. 943,108

Claims priority, application Sweden, Sep. 20, 1977, 7710507

Int. Cl.[2] G01B *7/00, 7/28*

U.S. Cl. 33—174 L **4 Claims**



1. A position indicator to be used for control measurements of surfaces which have been subjected to treatment by a machine tool or the like, comprising;

a housing having an end wall provided with an opening therein;

a measuring probe movably mounted in the housing and projecting outwardly through said opening, the relative movement between the probe and the housing constituting a measurement of the discrepancy of the surface from the desired shape;

the mounting for the probe comprising a plate attached to the probe transversely of the axis thereof;

biassing means urging the periphery of said plate into abutting contact with the inner side of said end wall, whereby the probe is axially displaceable by contact with a surface and tiltable in all directions about the periphery of said plate, and;

a plurality of indicator means for generating output signals corresponding to the displacement of the periphery of the plate with respect to the end wall of the housing.

4,203,226

PATH TRACING DEVICE FOR SPREADING OR SPRAYING AGRICULTURAL TREATMENT PRODUCTS OR THE LIKE

Denis Hasquenoph, Bussy-Saint-Georges par Lagny, France, assignor to AGRAM, Saint-Denis, France

Filed Jul. 26, 1978, Ser. No. 927,993

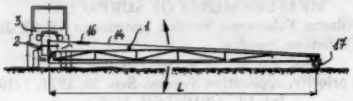
Claims priority, application France, Nov. 15, 1977, 77 34228; Jun. 30, 1978, 78 19620

Int. Cl.[2] G01B *3/00*

U.S. Cl. 33—185 V **18 Claims**

1. A device adapted to be connected to a tractor for tracing on the ground lines of a path to be followed for spreading or spraying treating material along parallel lanes of relatively great width, said device comprising a frame adapted to be fastened at one end to the front end of a tractor; a jib having a

length equal to the width of the lanes to be traced; means connecting one end of said jib to said frame for pivoting movement about a vertical pivot axis so that said jib can freely pivot in front of said tractor in one and the other direction; a ground engaging member on the other end of said jib to trace each line to be followed during the subsequent spreading or spraying operation; and retaining means for limiting the liberty of move-



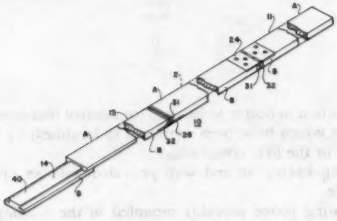
ment of the jib between two operating positions in each of which said jib extends laterally outwards on one or the other side of the tractor and at 90° to the median line thereof, said retaining means comprising a rope interconnecting a portion of said jib spaced from said frame to a portion of said frame spaced further from said one end of said frame than said vertical pivot axis.

4,203,227

TELESCOPIC STRAIGHT EDGE

Hector Giroux, Box 8131, Calgary, Alberta, Canada (T2J2V3)

Filed May 19, 1978, Ser. No. 907,881
Int. Cl.[2] **G01B** *3/06, 3/08*
U.S. Cl. 33—458 **1 Claim**



1. A foldable straight edge comprising

a plurality of hinged members pivotally joined together so as to be foldable about hinges from an extended position to a folded position,

said hinges flush mounted in the attached members, with

said hinged members each of a size and shape such that when assembled together, a first straight edge of each hinged member lies in a common plane in both the folded and the extended position and in all intermediate positions between said folded and said extended positions, with

the butt end of each hinged member adjacent a hinged joint, fitted with magnetic means to detachably latch to the adjacent butt end of the hinged member joined to the said hinged joint in the extended position of the two said hinged members, so as to latch the hinged members in said extended position, in which

the magnetic means comprises a magnet that is fixed to the butt hinged end of one hinged member and a magnetically attractable bar that is fixed to the butt hinged end of the other hinged member joined to a common hinge, in which

said hinged members are each of a size and shape that a bottom surface of each member that is at a substantial angle to the first edge of each said member lies along a common plane in the extended position of the hinged members, with each said bottom surface lying in parallel planes in the folded position of said hinged members, in which

a slidable member is joined to an end hinged member by a tongue and groove joint formed in the said members, with an end portion of said end hinged member formed with a recess so that the slidable member fits into said recess in the retracted position and with said end hinged member and said slidable member shaped so that a bottom surface of said slidable member lies along a common plane with a bottom surface of the portion of the end hinged member adjoining said end portion in both the retracted and the extended positions of said slidable member, in which

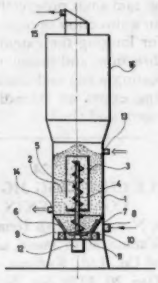
a first edge of the end hinged member slidably joined to the slidable member and a first edge of the slidable member lie in a common plane in all relative assembled positions of said members.

4,203,228

CONTACTING AND DRYING OF MATERIAL IN A SPOUTED SYSTEM

Emil Aradi; Tibor Blickle; Endre Monostori; Jenő Németh; Ivanne Pallai, all of Budapest, and János Varga, Mosonmagyaróvár, all of Hungary, assignors to MTA Müszaki Kémiai Kutató Intézet, Veszprém and Keszthelyi Agrártudományi Egyetem, Keszthely, both of, Hungary

Filed Jun. 26, 1978, Ser. No. 919,300
Int. Cl.[2] **F26B** *3/08, 7/00*
U.S. Cl. 34—10 **17 Claims**



1. An apparatus for at least partially drying a first material selected from the group consisting of granular material, powdered material, material in solution, material in suspension, paste-like material, and a fluid, and for mixing said first material with a second material selected from the group consisting of granular material, powdered material, material in solution, material in suspension, and paste-like material,

comprising in combination:

a container,

a longitudinal conveyor having its direction of elongation arranged substantially vertically, and being disposed in said container,

a tube having its direction of elongation arranged substantially vertically and being disposed in said container, said conveyor being at least partially disposed in said tube, and

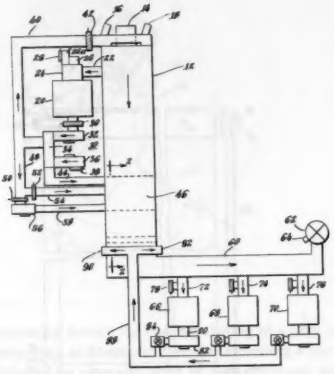
air supply means for blowing air at least in part upwardly through said tube into the mixed first and second materials, said mixed materials being at least partially loosenable and dryable by the at least partially upwardly moving air blown thereinto, and being operatively movable at least partially in an upward direction by said conveyor, and upon completion of the upwards motion being movable downwards within said container.

4,203,229

DRYER SYSTEM AND METHOD OF CONTROLLING THE SAME

Ronald W. Southworth, Atlanta, Ga., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 3, 1977, Ser. No. 838,561
Int. Cl.[2] F26B *21/10*
U.S. Cl. 34—46 6 Claims



1. A dryer system for reducing the moisture content of wood products to predetermined levels comprising:

a heat source for producing heated gases having a known constant temperature, said heat source having at least one inlet for admitting fuel thereto and an outlet;

a control stack capable of maintaining a constant negative pressure in the heat source and a constant gas temperature at said stack;

a supply plenum connecting said outlet from said heat source to said control stack, said supply plenum being adapted to receive the heated gases from said heat source;

at least one dryer for receiving the wood products to be dried, said dryer having inlet and outlet plenums and being connected to said supply plenum through said dryer inlet plenum; and

means for adding ambient air at said dryer inlet plenum to temper the heated gases so as to maintain a fixed temperature at the dryer outlet while varying the dryer inlet temperature as a function of the amount of moisture to be removed.

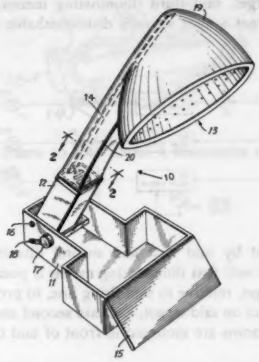
4,203,230

HAIR DRYER WITH COMPACTABLE BONNET

Raymond W. Kunz, Monroe, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,993
Int. Cl.[2] A45D *20/32*
U.S. Cl. 34—99 3 Claims

1. A device for drying hair comprising a self-supported hair dryer, a bonnet through which heated air from the hair dryer is directed onto a person's hair to be dried, said bonnet including a stem plenum portion and a head surrounding portion and an extensible bonnet support member attached to the hair dryer by being inserted into a slot therein, and extending through said stem plenum portion and said head surrounding portion of the bonnet, said support member being a flexible metal of a tape measure type structure having sufficient rigidity to support the bonnet and being rolled up into a coiled position when the hair dryer is not in use and is positioned for storage



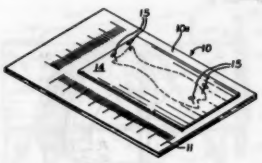
and being in an extended, uncoiled position when the bonnet is in place on the person's head.

4,203,231

DISSECTING BOARD AND PROCESS FOR DISSECTING A SPECIMEN

Richard Van Note, 456 Woodfield Trail, Roselle, Ill. 60172

Filed Jan. 11, 1978, Ser. No. 868,710
Int. Cl.[2] G09B *23/36*
U.S. Cl. 35—20 2 Claims



1. A dissecting board comprising a glass base having a flat top surface, and a plastic pad on top of said base, said pad covering only a portion of said base leaving an edge portion of said base uncovered, said uncovered edge portion having thereon a scale for measuring specimens used in dissection, said pad having a thickness of at least ¼ inch and a hardness of from 55 to 65 durometer.

4,203,232

NIGHT EFFECTS SIMULATOR

Lindsay C. Knight, Albury, Australia, and Roy E. Casey, Columbia, S.C., assignors to Australasian Training Aids Pty. Ltd., Albury, Australia

Filed Jan. 31, 1978, Ser. No. 873,924
Claims priority, application Australia, Feb. 2, 1977, PC8916
Int. Cl.[2] F41G *3/26*
U.S. Cl. 35—25 51 Claims

1. A night effects simulator to permit night firing, comprising

(a) at least one target, and means for supporting said target at a predetermined distance from a firing line,

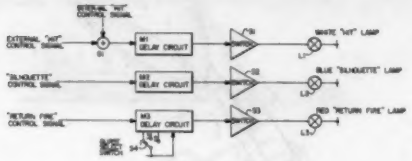
(b) first means for at least momentarily illuminating said target for observance by a trainee for firing purposes;

(c) hit detection means for sensing a target hit;

(d) second means for illuminating said target responsive to said target hit, said second illuminating means displaying

on said target a light visually distinguishable from the light provided by said first illuminating means, and

(e) third illuminating means for simulating return fire from said target, said third illuminating means displaying on said target a light visually distinguishable from the light



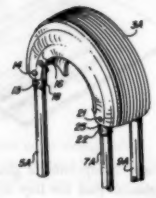
provided by said first and second illuminating means, wherein said first illuminating means is positioned behind said target, relative to said firing line, to provide a silhouette effect on said target, and said second and third illuminating means are mounted in front of said target.

4,203,233

CALF-TYING PRACTICE DUMMY

Charles J. Crane, Rte. 1, Box 63D, Tolleson, Ariz. 85353

Filed Jun. 23, 1978, Ser. No. 918,499
Int. Cl.[2] A63B 69/04
U.S. Cl. 35—29 R **4 Claims**



1. A practicing dummy for assisting a person in practicing for rodeo calf-tying events, said device comprising in combination:

(a) a front leg member;

(b) first and second hind leg members; and

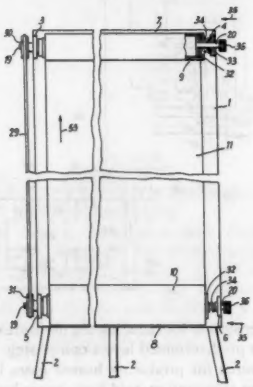
(c) body means connected to said front leg member and said first and second hind leg members for supporting and orienting said front leg member and said first and second hind leg members approximately perpendicularly to an axis of said body means and applying resisting forces tending to counteract any forces displacing said front leg member and said first and second hind leg members from said perpendicular orientations thereof, said counteracting forces being sufficient in magnitude to untie an insecurely tied calf-tying competition knot, said body means flexing in an approximately natural manner during scooping of said first and second hind leg members and crossing said first and second hind leg members over said front leg member during said practicing, wherein said body means is composed of a half of an automobile tire, said front leg member being bolted to one end of said half-tire and said first and second rear leg members being bolted to opposed side walls of the other end of said half-tire.

4,203,234

ROLLABLE CHART

Christian Thenon, Chatillon-sur-Cluses, France, assignor to De Visu International, Igny Zai, France

Filed Jul. 7, 1978, Ser. No. 922,530
Claims priority, application France, Jul. 8, 1977, 77 21396
Int. Cl.[2] G09B 29/06
U.S. Cl. 35—76 **3 Claims**



1. A rollable chart comprising

a base

a first rotatable support on said base,

a second rotatable support on said base in spaced parallel relation to said first support,

a web of flexible material wound on the first support and the second support and having an exposed portion between the supports

a first pulley adjacent said first rotatable support,

a second pulley adjacent said second rotatable support

an endless flexible band extending around said pulleys, said band being exposed and comprising means for manually rotating said pulleys in response to manual manipulation of said band,

first unidirectional driving means for connecting said first pulley to said first rotatable support to wind said web onto said support in response to manual movement of said band in a first direction, and second unidirectional driving means for connecting said second pulley to said second rotatable support in response to manual movement of said band in the opposite direction, each unidirectional driving means comprising

an internally toothed surface near one end of a support,

a disc fixed to a pulley for rotation therewith, said disc being axially adjacent said toothed surface, an inclined cam groove formed in said disc,

a sliding pawl having a pin extending into said cam groove, and

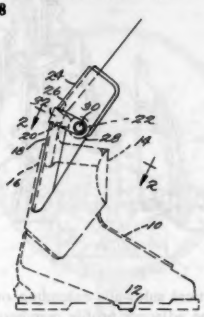
means for guiding the pawl radially toward and away from the internally toothed surface,

said cam groove forcing said pawl into driving engagement with said internally toothed surface in response to rotation of its pulley in one direction, and maintaining said pawl spaced from the internally toothed surface in response to rotation of its pully in an opposite direction.

4,203,235
SKI TRAINING DEVICE

R. Harrison Van Pelt, Jr., 679 S. Reed Ct., A-2, #401, Lakewood, Colo. 80226

Filed Feb. 15, 1978, Ser. No. 877,941
Int. Cl.[2] A43B 5/04
U.S. Cl. 36—118 8 Claims



1. An accessory device for canting the leg of a user relative to a ski comprising an abutment member including a pair of ear portions located on opposite sides of said abutment member, said abutment member and ear portions being located adjacent the upper rear portion of a ski boot,

a canting member having a leg engaging portion, an abutment surface at one end of said leg engaging portions and a pair of ear portions each located on opposite sides of said abutment surface,

each ear portion on opposite sides of said abutment member being pivotally connected, respectively, to an ear portion of said pair on the opposite sides of said abutment surface so that said canting member is pivotable relative to said abutment member to move said abutment surface toward and away from said abutment member,

limit means attached to said canting member so as to be insertable between said abutment member and surface, said limit means including at least two surfaces which converge from a base toward each other, one of said converging surfaces being engageable by said abutment member and the other of said converging surfaces being engageable by said abutment surface when said limit means is inserted between said abutment member so that, when said abutment surface is moved toward said abutment member, the closest distance assumable between said abutment member and surface is determined by the extent to which said surfaces of said limit means are positioned therebetween,

said limit means further including means for locking said surfaces in a selected position relative to said abutment surface and member.

4,203,236
FOLDABLE SNOW SHOE

Alfred C. Erickson, 329 Black Oak Dr., Michigan City, Ind. 46360, and Clyde W. Erickson, Box 184, Sperry, Iowa 52650

Filed Oct. 2, 1978, Ser. No. 948,039
Int. Cl.[2] A43B 5/04
U.S. Cl. 36—123 13 Claims

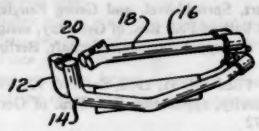
1. A snowshoe including

(a) a showshoe frame;

(b) webbing secured to said frame to provide a supporting surface;

(c) a first set of joint means attached to said snowshoe frame at longitudinally opposite ends thereof to allow said snowshoe frame to fold about its longitudinal axis; and

(d) a second set of joint means attached to said snowshoe frame at transversely opposite points thereof to allow said

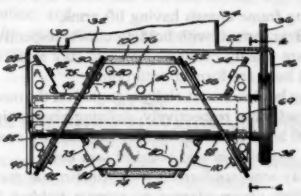


snowshoe frame to fold about a transverse axis passing therethrough.

4,203,237
SNOWBLOWER

Edward W. Enters, Fredonia, and Weldon R. Kuhn, Plymouth, both of Wis., assignors to Gilson Brothers Company, Plymouth, Wis.

Filed Jun. 15, 1978, Ser. No. 915,663
Int. Cl.[2] E01H 5/00
U.S. Cl. 37—43 E 22 Claims



1. A snowblower comprising,

a forwardly opening auger housing defining an auger chamber having opposite side walls, and a discharge opening in an upper portion thereof,

a wheel for supporting said housing for movement on the ground,

a prime mover supported by said housing, and

a rotatable auger rotatably drivingly connected to said primer mover, said rotatable auger including an auger cylinder having opposite ends and being rotatably supported in said auger housing for rotation about an axis, said auger being comprised of a pair of opposed stamped metal plates secured together and including opposed facing semi-cylindrical halves defining said auger cylinder, at least a pair of spaced apart auger flights, one of said auger flights supported by one of said ends of said cylinder and the other auger flight supported by the other of said ends of said cylinder, means for releasably securing said auger flights to said auger cylinder, and a radially extending impeller blade removably secured to said auger cylinder for rotation therewith for propelling snow through said discharge opening, said impeller blade having opposite ends, one of said impeller blade ends adjacent one of said auger flights and the other of said impeller blade ends adjacent the other of said auger flights.

4,203,238

RAPID-CHANGE DEVICE FOR ATTACHMENTS ON EARTH MOVING MACHINES

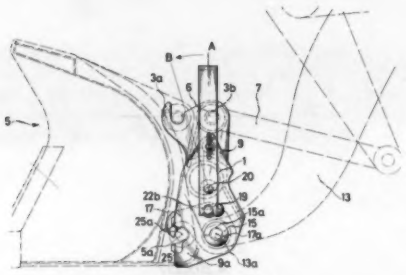
Hans Bangert, Sprockhövel, and Georg Fengler, Bergkamen-Oberaden, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,693

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734972

Int. Cl.[2] E02F *3/00*

U.S. Cl. 37—118 R 7 Claims



1. A rapid-change device for attachments on earth moving machines for connection between a lifting frame chassis which is hydraulically actuated from a carrier vehicle and an attachment implement, for instance a loading shovel having holding bolts, by means of holding claws and locking latches, comprising

a lifting frame chassis having lift arms,

stay arms formed with holding claws, respectively,

hubs are fixedly connected on said stay arms, respectively, said hubs are formed with bores,

locking latches are pivotally mounted on the outer periphery of said hubs, respectively, defining pivot points,

said lift arms of the lifting frame chassis are coaxially pivotally mounted in said bores of said hubs,

said stay arms are formed with semicircular recesses of said holding claws adapted to receive holding bolts of the loading shovel, respectively,

the center points of the semicircular recesses of said holding claws and said pivot points of said locking latches are coordinated with respect to each other such that the line of action of reaction forces introduced by the loading shovel extends through said pivot points for said locking latches and at lowest through said center points of said semicircular recesses.

4,203,239

PICTURE HOLDER

Alice J. Williams, 19 Marlton, and Martha D. Gregory, 18 Marlton, both of Gibbsboro, N.J. 08026

Filed Jul. 25, 1977, Ser. No. 818,452

Int. Cl.[2] G09F *1/10, 1/12*

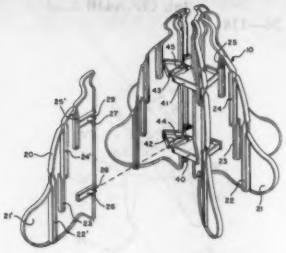
U.S. Cl. 40—152.1 8 Claims

1. A picture holding device for holding transparent sleeves in which pictures may be inserted, comprising:

(a) six to eight profile members, each member having two faces,

(b) an interconnecting means to connect the profile members to form a unit wherein the profile members project radially outward to form spaces between adjacent pairs of profile members, the interconnecting means comprising two identical discs, each with six to eight slots, equal to the number of profile members to be interconnected, these slots interconnecting with two complimentary slots on each profile member.

(c) three to five sleeve holding channel pairs on opposing faces of the adjacent profile member faces comprising two



essentially vertical sidewalls extending outwardly from the faces of the adjacent profile members, the channels forming a plane tangent to the circumference of a circle centered about the central axis of the picture holding device.

4,203,240

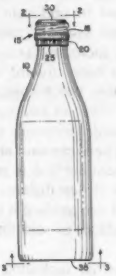
CONTAINER WITH RELATED INDICIA

George I. Goodwin, 3395 E. Point La., Bloomfield Hills, Mich. 48013

Filed Oct. 21, 1976, Ser. No. 734,458

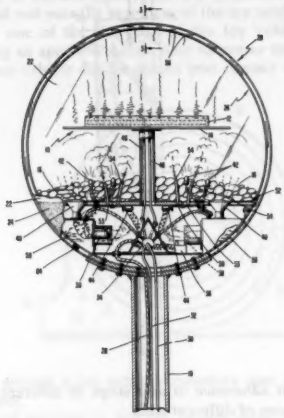
Int. Cl.[2] G09F *3/00*

U.S. Cl. 40—310 1 Claim



1. A returnable bottle having a closure cap for sealing said bottle in a fluid-tight manner, said closure cap including an upper removable sealing portion and a lower portion, said lower portion detaching from said sealing portion on the removal of said sealing portion from said bottle, and remaining with said bottle, said upper portion having a first tamper-proof indicia and said lower portion having a second tamper-proof indicia relating to said first indicia, said related indicia being different from indicia or similar bottles whereby said second indicia on said lower closure portion upon return of said bottle retaining said lower closure portion to a redemption center is matchable with said related first indicia on said detachable sealing closure portion to encourage the users of said beverage bottle to return said beverage bottle and said closure sealing portion to said redemption center for recycling thereof.

4,203,241
ACTION SIGN
Charles W. Wallace, Rte. #10, Marion, Ky. 42064
Filed Aug. 2, 1977, Ser. No. 821,141
Int. Cl.[2] G09F *19/00, 13/44*
U.S. Cl. 40—406 **9 Claims**



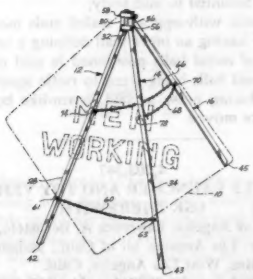
1. A three-dimensional action sign comprising a three-dimensional tableau of a product to be advertised and independent means for producing at least two separate visible actions in said sign, said independent means comprising means for producing a flame and means for producing smoke,

said tableau is of a simulated piece of meat disposed on a grill over a simulated charcoal fire;

said means for producing a flame causes a flame to rise from said piece of meat; and

said means for producing smoke causes smoke to rise from simulated charcoal fire.

4,203,242
SIGN STANDARD
Kenneth E. Griffin, 6304 - 204th SW., Lynnwood, Wash. 98036
Filed Dec. 7, 1978, Ser. No. 967,113
Int. Cl.[2] F16M *11/10, 11/16*
U.S. Cl. 40—610 **13 Claims**



1. A portable, retractable sign standard comprising:

(a) a formed first leg having a major lower section and a minor upper section, said two sections being angularly disposed relative to each other about a first medial juncture;

(b) a formed second leg having a major lower section and a minor upper section, said two sections being laterally angularly disposed relative to each other about a second medial juncture in a manner oppositely to said first leg;

(c) a rearwardly positionable third leg disposed between said first and second legs;

(d) arcuate joiner means interconnecting said three legs, said joiner means being fixedly attached to the upper end portion of one of said three legs;

(e) transverse openings being defined by the upper end portions of the other two legs for receiving said joiner means;

(f) said joiner means being lengthwise slidable through said two openings to permit said first, second and third legs to shift laterally between:

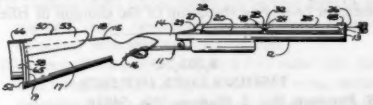
a closed position wherein said first leg lower section, said second leg lower section and said third leg being aligned adjacent to each other with said third leg being disposed between said first leg lower section and said second leg lower section, and said first leg upper section and said second leg upper section each extending upwardly and oppositely, laterally outwardly from said first and second medial junctures, respectively, and

an open position for supporting a sign wherein said upper sections of said first and second legs being aligned adjacent each other with the upper end portion of said third leg being disposed therebetween, and said lower sections of said first and second legs each extending downwardly and oppositely, laterally outwardly from said first and second medial junctures, respectively, while the lower portion of said third leg extending rearwardly of said first and second legs;

(g) a cross member fixedly attached to one of said first and second legs, said cross member being cantilevered generally laterally from its point of attachment to bear against the other of said first and second legs to restrain said first and second legs from pivoting about their respective longitudinal axis when said first and second legs being in open position; and

(h) means for supporting a sign mounted on said first and second legs.

4,203,243
RAISED RIB AND STOCK ELEVATOR ATTACHMENT FOR SHOTGUNS
Jack L. Hickman, 1809 Plaza Way, Walla Walla, Wash. 99362
Filed Jul. 17, 1978, Ser. No. 925,100
Int. Cl.[2] F41C *23/00*; F41G *1/42*
U.S. Cl. 42—73 **12 Claims**



1. A raised rib and stock elevator attachment for a shotgun having a barrel, a muzzle at a forward end of the barrel, a receiver at a rearward end of the barrel, a stock rearward of the barrel, a comb along a top side of the stock, and a butt plate at a butt end of the stock; said raised rib and stock elevator attachment comprising:

an elongated rib member having a forward end and a rearward end;

a first bracket member adapted to receive the rearward end of the rib member and mount it to the shotgun upwardly adjacent the barrel at the receiver thereof;

a second bracket member adapted to receive the forward end of the rib member and mount it to the shotgun upwardly adjacent the barrel at the muzzle thereof;

wherein the first and second bracket members each include first clamp means for adjustably securing the rib member to the respective bracket members, and second clamp

means adapted to securely mount the rib and bracket members to the shotgun;

a recoil plate;

a stock elevator member on the recoil plate and extending forwardly therefrom;

the stock elevator member having a concave comb receiving surface adapted to engage the comb of the shotgun stock; and

mounting means for adjustably securing the recoil plate and stock elevator to the butt plate of the shotgun stock;

wherein the rib member includes a horizontal sighting surface thereon and the stock elevator includes a cheek rest surface mountable to the shotgun at an elevation thereon such that the associated shotgun may be held in a shooting position with the user's eye in horizontal alignment with the sighting surface when his cheek rests against the cheek rest surface.

4,203,244

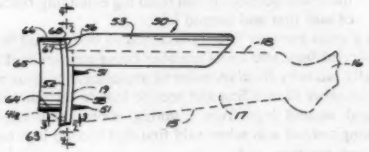
GUNSTOCK ELEVATOR ATTACHMENT

Jack L. Hickman, 1809 Plaza Way, Walla Walla, Wash. 99362

Filed Jul. 17, 1978, Ser. No. 925,101

Int. Cl.[2] F41C *23/00*

U.S. Cl. 42—73 **8 Claims**



1. A gunstock elevator attachment for a rifle or shotgun having a stock with a butt plate and a comb extending forwardly from the butt plate, said elevator attachment comprising:

a recoil plate;

a stock elevator member on the recoil plate extending forwardly therefrom;

said stock elevator having a concave comb receiving surface adapted to engage the comb of an associated shotgun or rifle; and

mounting means for adjustably securing the recoil plate to the butt plate of a shotgun or rifle with the stock elevator member overlying the comb of the shotgun or rifle.

4,203,245

FISHING LURE HOLDER

Jay B. Peterson, Rte. 3, Hudson, Wis. 54016

Filed Jun. 19, 1978, Ser. No. 916,562

Int. Cl.[2] A01K *97/06*

U.S. Cl. 43—25.2 **2 Claims**

1. Storage packet for fishing lures mounted on a fishing rod which comprises,

(a) a sheet of relatively thick flexible material adapted to resist penetration of a fishhook upon unforced contact,

(b) an elongated channel shaped clip having the exterior of one side wall affixed to one edge of the sheet with the channel opening outwardly away from the sheet, whereby the sheet may be first wrapped sidewise around a lure positioned against the exterior of the bottom wall of the clip and then engaged against the outside of the other side wall of the clip,

(c) the said other side wall of the clip and the side of the sheet engaging the lure both having strips of material mounted thereon adapted to adhere to each other to secure the sheet around the lure and against the clip, and

(d) the said strip on the sheet extending substantially along the entire width of the sheet perpendicular to the channel

to permit adherence of said strips at different places to secure lures of different sizes.

4,203,246

FISHING LURE SOUND PRODUCER

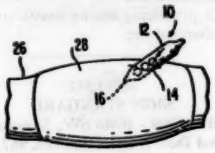
Max Sacharnoski, Sr., 112 Glenwood Dr., Paducah, Ky. 42001

Division of Ser. No. 260,334, Jun. 6, 1972, Pat. No. 3,988,851.

This application Apr. 9, 1975, Ser. No. 566,404

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.31 **1 Claim**



1. A noise making artificial fishing lure comprising:

an elongated worm-like body of soft flexible material;

a fish hook mounted to said body;

a glass capsule with opposite sealed ends mounted within said body having an inner wall defining a cavity; and,

a plurality of metal balls positioned in said cavity of said capsule, said balls being sized to rattle against said inner wall producing noise as said worm-like body and said capsule are moved.

4,203,247

TOY VEHICLE LAUNCHER AND TOY VEHICLE FOR USE THEREWITH

Walter Moe, Los Angeles; Lawrence A. Bernstein, Malibu, and David Heller, Los Angeles, all of Calif., assignors to Diker-Moe Associates, West Los Angeles, Calif.

Filed Jan. 30, 1978, Ser. No. 873,433

Int. Cl.[2] A63H *33/00*

U.S. Cl. 46—1 K **4 Claims**

1. A toy comprising, in combination, a toy vehicle and a toy vehicle launcher, the toy vehicle launcher including:

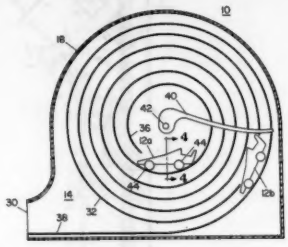
first and second spaced, generally parallel sidewalls each having an inner surface and an outer surface,

a first spiral retainer member attached to the inner surface of the sidewall,

a second spiral retainer member attached to the inner surface of the second sidewall, the second spiral retainer member being opposed to the first spiral retainer member,

each of the spiral retainer members comprising a predetermined number of turns and having a first end near the center of the sidewalls of the toy vehicle launcher and a second end near the periphery of the toy vehicle launcher,

at least one of the sidewalls of the toy vehicle launcher having an aperture therein near its center through which the toy vehicle can be placed into contact with the first



and second spiral retainer members near the first ends thereof,

a second aperture in the toy launch vehicle adjacent the second ends of the first and second spiral retainer members, and

drive means for driving the toy vehicle along the first and second spiral retainer members from the first ends thereof towards the second ends thereof,

the toy vehicle including means to engage the spiral retainer members of the toy vehicle launcher.

4,203,248

TOY FIGURE WITH CHANNELED LEG MEMBERS

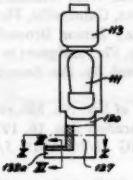
Erik P. Tapdrup, Sorgenfri near Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Division of Ser. No. 935,761, Aug. 22, 1978. This application Oct. 27, 1978, Ser. No. 955,257

Claims priority, application Denmark, May 2, 1978, 1902/78

Int. Cl.[2] A63H *33/08*

U.S. Cl. 46—22 **2 Claims**



1. A toy figure, adapted to be detachably mounted on a base plate pertaining to a building set and having a plurality of coupling studs uniformly spaced apart in both longitudinal and transverse directions, so that two pairs of adjacent studs define a square in which the distance between the axes of adjacent studs is equal to the module m of the building set, said toy figure comprising a head, a body, a pair of arms, and a leg assembly comprising a connecting piece adapted to be mounted on the body and including a pair of sidewardly extending pivots, a pair of identical leg members mounted on said pivots, said leg members having substantially flat rear faces (calves) and foot parts having a plane bottom face (sole), wherein the improvements consist in the provision of recesses in the form of channels extending lengthwise of the flat rear face (calf) of the leg members and recesses in the bottom face (sole) of the foot parts, each of said recesses having a width substantially equal to the width of the coupling studs of the base plate and being disposed symmetrically with respect to an axis extending in the lengthwise direction of the leg member and foot part respectively, the distance between the said axes of symmetry, in the position of the leg members wherein the planes of their flat rear faces (calves) coincide, being equal to the module m of the building set.

4,203,249

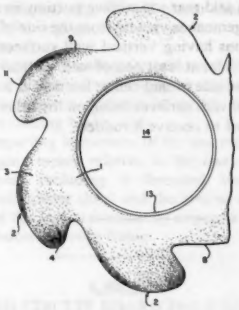
FLYING SAUCER OR THROWING DISK USED IN SPORTS GAMES

Hans-Peter Böhm, Welfenstrasse 7, 75 Karlsruhe, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,757

Int. Cl.[2] A63H *27/00*

U.S. Cl. 46—74 D **19 Claims**



1. A throwing disk comprising:

(a) a substantially planar, central ring part having an aperture, an inner edge, and an outer circumference;

(b) a plurality of wings distributed about said outer circumference; each of said wings comprising:

(1) a substantially planar first wing section directly adjoining said outer circumference and being substantially co-planar with said central ring part;

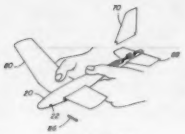
(2) a second wing section with a free outer rim, said second wing section adjoining said first wing section and extending, with respect to said outer circumference, essentially in a peripheral direction and being bent with respect to said first wing section; and

(3) a further free rim adjoining the first wing section; wherein:

(i) said second wing section is bent in such manner that said bend is located along an edge of said first wing section which forms an angle of between 40°–50° with a chord of the outer circumference of said central ring portion, said cord originating at the ending point of the first wing section and terminating at the starting point of the first wing section with respect to said outer circumference of the central ring part and;

(ii) said further free rim of said first wing section is bent in a direction opposite to the bend of said second wing section such that when said central ring part is in a horizontal position, the bends of said free rim and said second wing section extend in respective upward and downward directions.

4,203,250
MOLDED MODEL AIRPLANE
Vito M. Garofalo, Chicago, Ill., assignor to The Hi-Flier Manufacturing Company, Decatur, Ill.
Filed Jan. 5, 1979, Ser. No. 1,173
Int. Cl.[2] A63H 27/00
U.S. Cl. 46—79 8 Claims

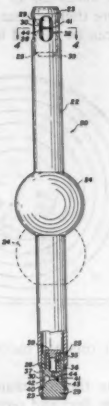


1. A model airplane fuselage molded from plastic foam comprising:
a main body with a major axis and a top surface having a center line and a rear portion,
said body including a linear series of vertical projections rising from said rear top surface portion, in a nonoverlapping arrangement as viewed from the side of said fuselage,
said projections having vertical wall surfaces spaced from said center line, at least one of said vertical wall surfaces being on one side of said center line and at least another of said vertical wall surfaces being on the other side, to form a rudder slot to receive a rudder.

4,203,251
TOY BALL WITH GEAR-DRIVEN FIGURE
Jack H. Malek, Westbury, N.Y., and Herman M. Siegel, Stamford, Conn., assignors to CBS Inc., New York, N.Y.
Filed May 8, 1978, Ser. No. 904,041
Int. Cl.[2] A63H 15/00
U.S. Cl. 46—107 8 Claims

6. A toy comprising a rigid, hollow transparent ball, a figure within said ball, a first gear fixed to the inner periphery of said ball, said first gear being an annular gear having teeth on its inner periphery, a second gear meshed with said first gear and rotatable relative thereto, said second gear being within said first gear and being fixedly secured to said figure, means defining a bearing for said figure within said sphere, said bearing being generally diametrically opposite said first gear.

4,203,252
SOUND ADMITTING AERIAL TOY
Wilbert A. Howie, 602 Thetis Place, Richmond, British Columbia (V7C 2N3)
Filed May 24, 1978, Ser. No. 909,291
Int. Cl.[2] A63H 5/00
U.S. Cl. 46—178 13 Claims



1. A toy comprising an elongate body dimensioned to be held in the hand,
means responsive to the passing of air to produce a sound, said means comprising a chamber having a restricted passageway opening outwardly from the toy, said means being positioned at each end of the elongate body whereby throwing the body through the air produces the sound, and
a weight at the center of balance of the body to facilitate cartwheeling of the body when the toy is thrown upwardly.

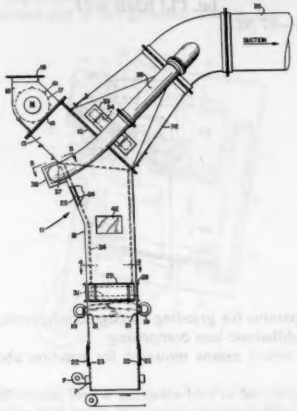
4,203,253
PROCESS FOR INCREASING OLEORESIN SYNTHESIS IN PINUS SPECIES
Karl E. Wolter, Evansville, Wis.; William J. Peters, Lake City, Fla.; Donald R. Roberts, Gainesville, Fla.; Robert D. McReynolds, Lake City, Fla.; Junior Broomfield, and Ernest R. Crews, both of Olustee, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Continuation-in-part of Ser. No. 869,891, Jan. 16, 1978, abandoned. This application Jan. 16, 1979, Ser. No. 3,700
Int. Cl.[2] A01G 23/10; A01N 5/00, 9/36
U.S. Cl. 47—10 5 Claims

1. A method of chemically inducing the deposition of increased quantities of naval stores products within living pine trees by stimulating lightwood formation in large areas of said pine trees with an effective amount of a mixture of a bipyridilium salt and an ethylene releasing chemical; permitting the so-treated pine trees to grow for a time sufficient for lightwood development; harvesting the resulting pine trees; and extracting naval stores from the harvested tree.

4,203,254
FLAME TREATMENT APPARATUS
James D. Downing, Scott, Miss., assignor to Delta and Pine Land Company, Scott, Miss.
Filed Nov. 6, 1978, Ser. No. 957,817
Int. Cl.[2] F26B 19/00
U.S. Cl. 47—58 13 Claims

1. In flame treatment apparatus for delinting cottonseed

means providing a passage for traverse by a stream of seed to be delinted, means for controllably effecting substantial separation of incoming seed and distribution across the passage, means operatively connected to said passage for positively



providing movement of air through said passage countercurrent to seed movement, and means providing a transverse curtain of flame across said passage whereby fibrous material on the seeds is ignited and at least partially burned off as the seeds travel through said passage.

4,203,255

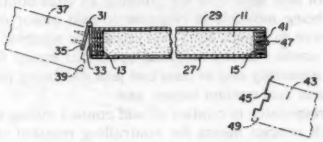
FIRE-RESISTANT COMPOSITE WOOD STRUCTURE PARTICULARLY ADAPTED FOR USE IN FIRE DOORS

Edwin N. Naslund, and Ian MacDonald, both of Santa Rosa, Calif., assignors to Cal-Wood Door, Santa Rosa, Calif.

Continuation-in-part of Ser. No. 800,785, May 26, 1977, Pat. No. 4,104,828. This application Aug. 4, 1978, Ser. No. 931,259

Int. Cl.[2] E04B *1/94*; B27K *3/18*

U.S. Cl. 49—399 **9 Claims**



1. A fire-resistant wood based structural material comprising:

a first layer of material being formed from a slurry mixture of wood chips, ground bark and a fire-retardant chemical that is formed into a board by pressure and drying,

a second layer of material being formed from a slurry mixture of individual wood fibers and a fire-retardant chemical that is formed into a board by heat and pressure, said first and second material layers being firmly adhered to each other in their dry states, thereby forming a composite structural material,

a third layer of material of the same type and substantially the same thickness as said second layer, said third layer is firmly adhered to said second layer on a side opposite from that adhered to said first layer.

4,203,256

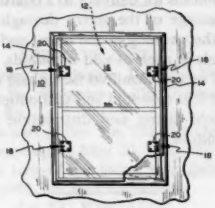
STORM WINDOW ASSEMBLY

Dale A. Mowry, 166 R. E. Maple St., Clyde, Ohio 43410

Continuation-in-part of Ser. No. 831,181, Sep. 7, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 949,699

Int. Cl.[2] E05C *21/02*

U.S. Cl. 49—465 **6 Claims**



1. A storm window assembly for attachment to a window opening frame comprising:

a planar sheet of transparent material;

cooperating window opening frame engaging means including at least one arm having one end extending outwardly toward a marginal edge of said planar sheet and adapted to frictionally engage a planar portion of the window opening frame;

means for pivotally mounting the other end of said cooperating window opening frame engaging means to said planar sheet of transparent material including at least one upstanding mounting brace; and

means for imparting movement of the one end of the arm of said engaging means relative to the one surface of said planar sheet including a threaded shank extending through said planar sheet and the arm so as to cause the one end of the arm to frictionally engage a planar portion of the window opening frame.

4,203,257

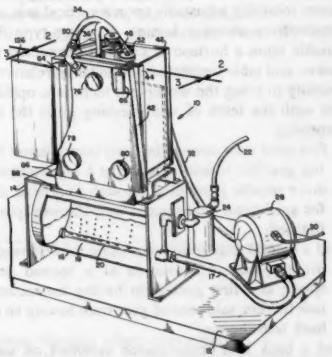
PRINTED CIRCUIT BOARD HOLE CLEANER

John W. Jamison, Mission Viejo; William R. Welty, Fullerton, both of Calif., and Vincent A. Masciello, deceased, late of Rowland Heights, Calif. (by Doris E. Masciello, heir), assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 801,936, May 31, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,315

Int. Cl.[2] B24B *19/22*

U.S. Cl. 51—2 R **7 Claims**



1. A machine for cleaning holes through a flat board, said machine comprising:

a first manifold having liquid slurry distribution channels therein;

a second manifold having liquid slurry distribution channels therein;

supply means connected to both said manifolds for supplying an abrasive carrying liquid slurry through said manifolds and to said liquid slurry distribution channels in both of said manifolds for delivery to a board facing said manifold for passage of the slurry through the holes in the board for the cleaning of the holes; and

outlet channels in each of said manifolds, said outlet channels of said second manifold facing said distribution channels of said first manifold and said outlet channels of said first manifold facing said distribution channels of said second manifold.

4,203,258

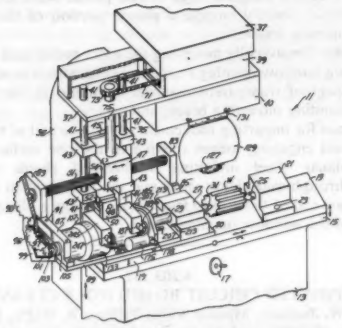
GEAR FINISHING MACHINE

Gerhard R. Held, 22644 Shiell Dr., Mt. Clemens, Mich. 48043

Filed Dec. 22, 1978, Ser. No. 972,207

Int. Cl.[2] B24B 5/00

U.S. Cl. 51—95 GH **25 Claims**



1. In a gear finishing machine having a base, a vertically adjustable table support, a horizontally reciprocal table having a head stock and tail stock to axially and rotatively support a workpiece gear to be finished, a pedestal on said base including a top plate overlying said table and mounting a motor-operated transmission, and a machine head depending from said transmission rotatably adjustable upon a vertical axis, and mounting a powerdrive abrasive honing or other type finishing gear rotatable upon a horizontal axis and connected to said transmission, said table support and head being relatively adjustable vertically to bring the workpiece teeth into operative engagement with the teeth of said finishing gear; the improvement comprising:

a first gear train connecting said transmission to said finishing gear for rotation thereof at a predetermined speed;

a drive spindle journalled through said head stock adapted for axial drive engagement with the workpiece gear to be finished;

and a second gear train connecting said transmission to said drive spindle for rotation at a second predetermined speed; said first gear train having an accumulated back lash therein; said second gear train having an accumulated back lash therein;

and a back lash compensator mounted on said table and connected to said gear train, for equalizing the accumulated backlash in the gear trains, and modifying the accumulated backlash in said second gear train.

4,203,259

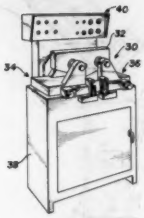
APPARATUS FOR EDGING OPHTHALMIC LENSES

Fred Haddock, Muskogee, Okla., assignor to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed May 17, 1978, Ser. No. 906,883

Int. Cl.[2] B24B 9/14

U.S. Cl. 51—97 NC **11 Claims**



1. An apparatus for grinding an edge configuration upon at least one ophthalmic lens comprising:

abrading wheel means mounted for rotation about a first axis;

means connected to said abrading wheel means for rotating said abrading wheel means about said first axis;

means for rotatably mounting at least one lens to be edge ground about a second axis;

motor means for translating said second axis toward and away from said first axis for engaging a peripheral portion of said at least one lens with a peripheral portion of said abrading wheel means;

means for rotating said at least one lens about said second axis;

electronic machine means for determining radial dimensions of said at least one lens at predetermined angular positions about the periphery of said at least one lens for a selected lens shape; and

means operable in response to a signal from said electronic machine means for controlling the radial position of a peripheral portion of said at least one lens with respect to a peripheral portion of said abrading wheel at said predetermined angular position about the periphery of said at least one lens, said means for controlling the radial position of said at least one lens including,

motor means responsive to signals from said electronic machine means,

contact means mounted for reciprocation upon a base portion of said apparatus for grinding an edge configuration and being movable in response to said motor means responsive to signals from said electronic machine means;

switch contact means mounted upon said means for rotatably mounting said at least one lens and being positioned adjacent said contact means, and

means responsive to contact of said contact means with said switch contact means for controlling rotation of said at least one lens and the radial position thereof with respect to said abrading wheel.

4,203,260

APPARATUS FOR GRINDING CYLINDRICAL GEARS

Daniel A. Fivian, Horgen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zürich, Switzerland

Division of Ser. No. 828,500, Aug. 29, 1977, Pat. No. 4,142,333.

This application Apr. 10, 1978, Ser. No. 895,347

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641554

Int. Cl.[2] B23F 5/02

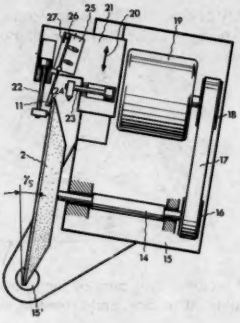
U.S. Cl. 51—123 G **5 Claims**

1. An apparatus for grinding gears by means of a generating method, comprising:

means for machining a right tooth flank and a left tooth flank

of a gear comprising a pair of grinding wheels, each having a substantially point-shaped contact zone disposed at a respective lateral edge of each grinding wheel, each grinding wheel being rotatable about a respective axis;

a respective grinding support upon which there is mounted an associated one of the grinding wheels; and



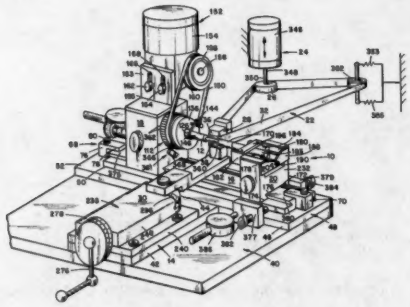
means for pivotably mounting each grinding support about a pivot axis, said pivot axis being arranged transversely of the rotational axis of the associated grinding wheel, said pivotable mounting means being positioned such that said pivot axis substantially intersects the point-shaped contact zone of the associated grinding wheel.

4,203,261

ABRASIVE BELT MACHINING APPARATUS

David L. Davies, Cuiaba, Brazil, assignor to Tasco, Inc., Oak Ridge, Tenn.

Filed Mar. 14, 1977, Ser. No. 777,470
Int. Cl.[2] B24B *21/02*
U.S. Cl. 51—141 **17 Claims**



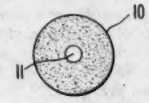
1. An abrasive belt apparatus adapted for machining a workpiece comprising: a frame, means mounted on said frame for positioning said workpiece along a predetermined axis; endless abrasive belt means disposed in a plane substantially aligned with the axis of the workpiece, means engaging said belt means for driving said abrasive belt means; contact means defining a precisely machined contoured face which engages a section of said abrasive belt means for guiding said belt means along a predetermined path, means mounted on said frame for supportably engaging said contact means, means for moving said contact means along an axis substantially perpendicular to said axis along which said workpiece is positioned, said means for moving said contact means including means for precisely controlling the position of said contact means whereby a preselected contour and finish is produced by movement of said contact means to bring said abrasive belt into contact with said workpiece said means for precisely moving said contact means serving to advance said contact means towards the axis of said workpiece, thereby imparting the contour of said contact means face into said workpiece as stock is removed from said workpiece such that the finished workpiece incorporates a surface having a preselected contour which is substantially identical to the contoured face of said contact means.

4,203,262

ABRASIVE DRILL

Bruce W. Dunnington, Wilmington, Del., and William B. Gernert, St. Davids, Pa., assignors to The Glennel Corporation, Chester Springs, Pa.

Continuation-in-part of Ser. No. 731,039, Oct. 8, 1976, abandoned. This application May 23, 1978, Ser. No. 908,704
The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.
Int. Cl.[2] B24D *17/00*
U.S. Cl. 51—204 **12 Claims**



1. A cylindrical micro-drill having a diameter on the order of tenths of a millimeter to about a millimeter in extent, comprising a solid non-abrasive filamentary cored portion concentric with the longitudinal axis of the drill, and a surrounding solid contiguous portion disposed concentrically about the solid cored portion and comprising abrasive particles in a metallic matrix.

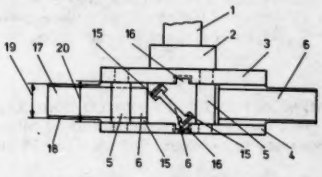
5. Method of forming a cylindrical drill of at most about one millimeter diameter, comprising providing a taut filamentary mandrel concentric with the intended longitudinal axis of the drill and being in lateral extent from about one-twentieth to one-third of the intended drill diameter, and depositing metallic matrix material containing abrasive particles entrained therein uniformly onto the filamentary mandrel to obtain a cylindrical drill body contiguous therewith and extending to the intended diameter.

4,203,263

SLINGING WHEEL FOR CENTRIFUGAL JET MACHINES

Jindrich Fiala, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Oct. 31, 1978, Ser. No. 956,289
Claims priority, application Switzerland, Nov. 17, 1977, 14040/77
Int. Cl.[2] B24C *5/06*
U.S. Cl. 51—434 **8 Claims**



1. A centrifugal blasting wheel comprising

first and second discs having uniformly distributed, radially extending grooves in inwardly facing surfaces thereof, said grooves and said discs defining a central cylindrical volume of predetermined diameter;

spacer means for maintaining said discs in substantially parallel relationship; and

a plurality of blades releasably mounted to and between said discs, each of said blades having

a disc-engaging end portion with rib means shaped and dimensioned for engaging said grooves, each said end portion having a length smaller than said predetermined diameter, and

a remaining portion with a maximum transverse dimension smaller than a minimum distance between said inwardly facing surfaces of said discs;

whereby each of said blades may be radially inserted between said discs from outside the periphery of said discs in an orientation rotated from its installed position until said end portion occupies said central volume, be rotated about its longitudinal axis and be extracted radially to engage selected ones of said grooves.

4,203,264

FIREPROOF BUILDING ELEMENT

Werner Kiefer; Dieter Krause, both of Mainz-Mombach; Herwig Scheidler, Finthen; Hans-Wilhelm Schulze, Main, and Klaus Kristen, Wiesbaden, all of Fed. Rep. of Germany, assignors to JENAer Glaswerk, Schott, Fed. Rep. of Germany

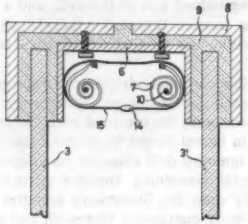
Continuation of Ser. No. 679,851, Apr. 23, 1976, abandoned.

This application Feb. 16, 1978, Ser. No. 878,530

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2519176

Int. Cl.[2] E04B *1/92*; E06B *9/02*

U.S. Cl. 52—1 **21 Claims**



1. Fire proof building element with a multi-sheet glazing unit of glass or glass ceramic characterized in that at least one of the glass sheets of the multi-sheet glazing unit is a fire resistant glass sheet consisting of a glass whose product of the thermal expansion unit α (20°–300° C.) and elasticity module E is between 1 and 5 (kg/cm^2.°C.), the distance between the sheets being between 2 mm and 150 mm, and characterized in that the building element contains one or more high heat reflective foils arranged between the sheets at a distance from the fire resistant glazing unit, the high heat reflective foil reflecting over 90% of the radiation, and also characterized in that the high heat reflective foil is put in a rolled up form or in a folded form between the two sheets of the building element such that the visible area is not covered and which can, in the event of a fire, be spread out completely between the glass sheets.

4,203,265

HUB AND STRUT SYSTEM FOR GEODESIC DOMES

Robert P. Ivers, and Mark J. Thimsen, both of Minnetonka, Minn., assignors to Geodesic Shelters, Inc., Minnetonka, Minn.

Filed May 12, 1978, Ser. No. 905,227

Int. Cl.[2] E04B *1/32*

U.S. Cl. 52—81 **8 Claims**

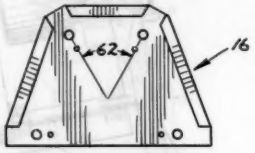
1. A hub and strut system for geodesic domes comprising:

(A) a generally flat polygonal hub plate, said plate having an inner and outer face,

(B) a plurality of spaced apart rabbets recessed into at least some of the polygonal edges of the plate in the outer face thereof, said rabbets corresponding in number to the triangular dome segments converging at the hub,

(C) a plurality of fastener-receiving apertures extending through the plate spaced inwardly from the edges thereof adjacent the ends of said recessed rabbets and along generally radial lines,

(D) a plurality of elongated struts converging upon said hub, said struts being of generally rectangular cross section and having inner and outer faces,



(E) a rabbet recessed into each of the opposite edges of at least said outer strut faces and extending the length of the strut,

(F) a hub-engaging surface at each end of said struts,

(G) a fastener-receiving aperture extending through each of said struts adjacent the ends thereof, and

(H) fastening means extending through the apertures in said hub and said struts to secure the same together.

4,203,266

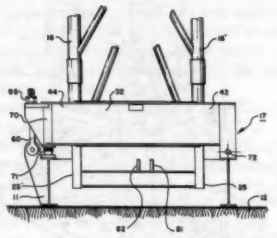
MAST LEVELING AND SUPPORT APPARATUS

Thomas R. Hollier, Vidor, and Robert E. Johnson, Beaumont, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 15, 1977, Ser. No. 860,668

Int. Cl.[2] E04H *12/34*

U.S. Cl. 52—116 **4 Claims**



1. An apparatus for aligning a mast assembly used with earth boreholes, comprising:

a skid unit;

a platform having first and second opposing end portions, the first said end portion being pivotally attached to said skid unit to pivot about an axis lying along one side of said skid unit and the second said end portion being movable with respect to said skid unit;

a hinged mast attached to said platform to pivot about an axis generally perpendicular to the pivotal axis of said platform and said skid unit and being adapted to be pivoted for raising to an erect position for use with respect to said platform;

means attached between said mast and said platform for raising said mast;

means for causing said platform to pivot with respect to said skid unit including an upwardly facing shoulder on an upper surface portion of said skid unit;

a downwardly facing shoulder on a lower surface portion of

said platform substantially vertically positioned above said skid unit upwardly facing shoulder;

a jack screw mounted between said shoulders and operable to control the minimum distance between said shoulders and thereby effect pivoting of said platform relative to said skid unit; and

means, independent of said means for causing said platform to pivot, to rigidly secure said platform from pivotal motion relative to said skid unit including an upwardly facing surface portion on said platform having an opening therethrough and an upwardly facing shoulder around said openings;

a bolt mounted with said skid unit and extending upwardly through said opening; and

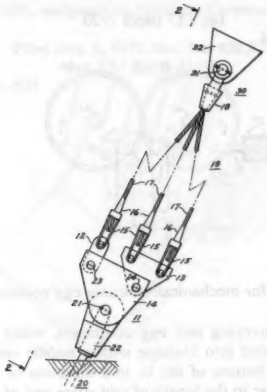
a nut threadedly mounted on the upper end portion of said bolt and engaged with said platform upwardly facing shoulder and thereby operable to limit pivoting movement of said platform away from said skid unit and secure said platform in place against said jack screw.

4,203,267

MULTIPLE STRAND TOWER GUY ASSEMBLY

Winfield S. Langhorst, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 31, 1978, Ser. No. 929,612
Int. Cl.² E04H *12/20*
U.S. Cl. 52—148 **4 Claims**



1. A multiple strand guy assembly comprising:

(a) a plurality of wire strand lengths each length having a first end and a second end,

(b) a first anchor means,

(c) tension equalizer means connected to the first anchor means and to the first end of each of the plurality of wire strand lengths, and

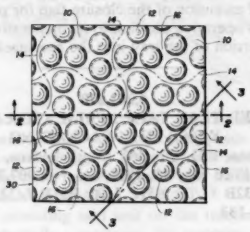
(d) a second anchor means spaced from the first anchor means and including a single wire rope socket having the second end of each of the plurality of wire strand lengths anchored together in a socketing material selected from a group consisting of resin and zinc in the single wire rope socket.

4,203,268

STRUCTURAL MEMBER AND COMPOSITE PANEL INCLUDING SAME

Robert S. Gladden, Jr., Severna Park; Richard J. Johnson; Michael J. Karmazyn, both of Baltimore, and Donald L. Tate, Severna Park, all of Md., assignors to Tate Architectural Products, Inc., Jessup, Md.

Filed Mar. 13, 1978, Ser. No. 885,991
Int. Cl.² E04C *2/32*
U.S. Cl. 52—630 **25 Claims**



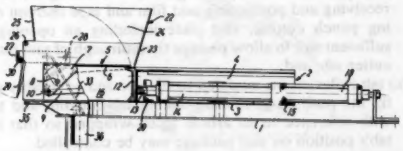
1. A sheet of structural material having formed therefrom a plurality of similar dome-like projections extending from the plane of said sheet and of which at least a major portion of the configuration of each projection is circular in plan view, said projections in the plane of said sheet being arranged in a structurally strategic geometric pattern in which rows of equally-spaced pairs of in-line projections are interwoven perpendicularly with other such rows of pairs in a basket weave fashion so that the portion of a centerline of a row of pairs of projections that lies between two aligned pairs bisects the pairs thereof in transverse rows and has sufficient pattern density to block straight lines of clear vision repeatedly in all directions across said sheet to form a one-piece rigid structural member capable of resistance to flexure and the portions of said member which are intermediately between said projections comprising continuous structural ribbonlike stress sections of fluctuating width and arcuate in plan view capable of optimizing stress-resisting integrity.

4,203,269

PACKAGING APPARATUS

Gunnar C. Petersen, No. 14 Rødkildevanget, 5230 Odense, Denmark

Filed Jan. 18, 1979, Ser. No. 4,543
Claims priority, application Denmark, Jan. 27, 1978, 408/78
Int. Cl.² B65B *57/12, 43/36*
U.S. Cl. 53—77 **7 Claims**



1. Apparatus for the batch-wise transfer of articles from an apportioning device to a receptacle, comprising a frame,

an elongate tray of U-shaped, upwardly open cross-section,

means for reciprocating the tray longitudinally on the frame between a retracted position in which the front end of the tray is located opposite the mouth of an open receptacle, and an advanced position in which the tray has been inserted in the receptacle,

a closure flap pivotable on a transverse axis adjacent the front end of the tray between an operative position which it assumes when the tray is retracted and in which it closes

the front end of the tray, and an inoperative position in which it leaves said front end open,

a pusher connected to the tray and movable relative thereto in the longitudinal direction of the tray, which pusher, when retracted relative to the tray, forms the rear wall of an open-top compartment within the tray,

means for introducing a portion of articles into the compartment in the retracted position of the tray,

means for shaking the tray in the longitudinal direction thereof, and

a stationary abutment means adapted to cooperate with an upward extension of the closure flap for pivoting the flap from its operative position to its inoperative position during insertion of the tray into the receptacle.

4,203,270

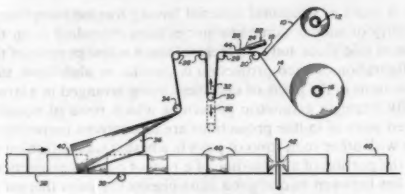
HIGH SPEED TEAR TAPE APPLICATOR FOR SHRINK WRAP FILM PACKAGING

Harold Forman, P.O. Box 363, Conshohocken, Pa. 19428

Filed May 19, 1978, Ser. No. 907,798

Int. Cl.[2] **B32B** *31/00;* **B31F** *5/00;* **B31B** *1/22;* **B65B** *61/18*

U.S. Cl. 53—133 **4 Claims**



1. Apparatus for forming an adjustable tear tape with tab opening means in a continuous shrink wrapper film application comprising:

(a) guide means for positioning an advancing wrapper film web;

(b) guide means for adjustably positioning an advancing continuous tear strip tape against the surface of said advancing film web;

(c) punch cutting means including a proximal longitudinally extending tubular shank and an integral distal nib as a cutting blade, said nib defining a portion of the exposed edges of said shank lying along a surface generally diagonal to the longitudinal axis of said shank, said punch cutting means being positioned at a pre-fixed distance and angle with respect to said film surface so that in operation, advancing film and tape are severed to form a generally arcuate tab at pre-fixed intervals on said film by penetration thereof by said nib;

(d) a support plate co-operating with said cutting means for receiving and positioning said film and tape thereon during punch cutting, said plate including an opening of sufficient size to allow passage therethrough of said punch cutter nib; and,

(e) tab roller means mounted to receive and adjustably prefix the position of said advancing tab-cut film and tape with reference to an article to be wrapped so that said tab's position on said package may be controlled.

4,203,271

INDEXING APPARATUS FOR CASE PACKER

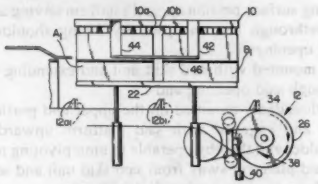
John L. Raudat, Madison, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Nov. 24, 1978, Ser. No. 963,368

Int. Cl.[2] **B65B** *43/48*

U.S. Cl. 53—250 **4 Claims**

4. In a cyclically operable case packer for packing cases with slugs of articles, the combination comprising means for simultaneously raising at least one case for loading at a packing station where the articles are adapted to be dropped into the case, case infeed means including an intermittently driven endless chain conveyor means having pushers for indexing cases cyclically along its upper run so that at least one case at a time can be raised at said packing station, said conveyor means including sprocket means at opposite ends of said endless chain conveyor, one of said sprocket means at the downstream end thereof being driven, drive means for said one sprocket means and including a drive chain and idler sprocket means engageable with said drive chain to hold it in a normal drive orientation, and means for selectively shifting said idler sprocket means to shift the drive chain between its normal drive orientation to a second position to backup said drive sprocket means and hence the pushers on said intermittently driven endless chain conveyor.



4,203,272

MECHANISM FOR CLOSING EGG CONTAINERS

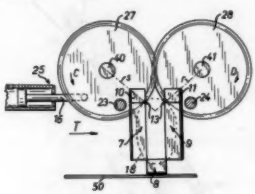
Aimé Minéry, Hesingue, France, assignor to Toni Casutt, Zollikon, Switzerland

Filed Mar. 8, 1979, Ser. No. 18,798

Claims priority, application Switzerland, Mar. 9, 1978, 2559/78

Int. Cl.[2] **B65B** *7/20*

U.S. Cl. 53—374 **8 Claims**



8. A machine for mechanically closing egg containers comprising:

means for conveying said egg containers, when the container is folded into U-shape with a middle corrugation strip at the bottom of the U, in a direction of transport perpendicular to the length of said strips and of said containers;

a pair of bending tools (**23, 24**) for bending or folding said sheet material, said tools being respectively movably parallel to the length of said strips; and

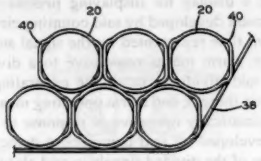
means (**25, 27, 28**) for driving said tools in a direction intersecting the location of the upstanding terminal strips of said container prefolded in said U-shape, when the container is on said conveyor at a location which is intermediate of the rest position of said tools, so as to cause said tools by moving towards each other to fold said terminal strips of the container towards and against each other and thereafter to cause said tools to move out of the path of transport of said containers in order to allow another of said containers to be conveyed to said location.

4,203,273

TUBING WITH FORMED ENDS FOR HEAT EXCHANGERS

David A. Edgecombe, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 794,449, May 6, 1977, abandoned. This application Mar. 17, 1978, Ser. No. 887,581
Int. Cl.[2] B65B *13/00, 27/10*
U.S. Cl. 53—399 2 Claims



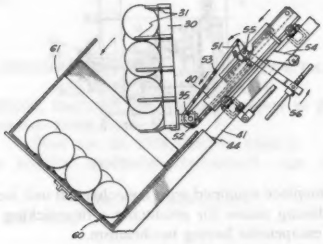
1. A method of preparing a group of straight length round tubes of equal outside diameter for shipment after being strapped in a bundle, comprising, arranging the tubes parallel to each other in a compact and contacting array and producing triangular-like spaces having curved sides between the tubes, strapping the tubes in a bundle for shipment, and then forming on one end of each tube a projection in one of the spaces between the tubes, produced by cold forging dimples in the tube ends, thus deforming the tube ends, and maintaining for the bundle so formed the same cross-sectional area as a bundle of an equal number of tubes without end projections.

4,203,274

APPARATUS FOR PACKING ARTICLES OF FRUIT INTO BOXES

Aaron J. Warkentin, Orange Cove, and Jacob Hiebert, Reedley, both of Calif., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 8, 1977, Ser. No. 858,821
Int. Cl.[2] B65B *35/30*
U.S. Cl. 53—537 17 Claims



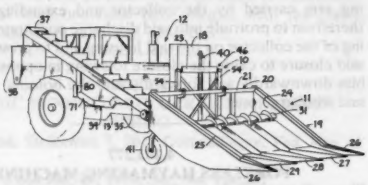
1. An apparatus for packing articles of fruit in a predetermined pattern into containers which comprises: a transfer rack adapted to receive articles of fruit from a feed means, a movable carriage on which the transfer rack is pivotally mounted; and an assembly for pivoting said transfer rack to deposit the fruit in a container, said assembly having a first rotational member pivotally mounted to said carriage, a second rotational member fixedly connected to said transfer rack where said rack is pivotally mounted to said carriage, means for causing said first rotational member to rotate when said carriage and transfer rack reach a predetermined position, and means for transmitting the rotation of said first rotational member to said second rotational member for causing said transfer rack to tilt to deposit the articles of fruit in the container.

4,203,275

TRACTOR MOUNTED HARVESTER UNIT

Gary J. Vermeer, Box 200, Pella, Iowa 50219

Filed Aug. 4, 1978, Ser. No. 931,192
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—15.8 3 Claims



1. A tractor mounted corn harvester unit mountable on a tractor vehicle and having a rear portion, opposite side frame members, and ground engaging wheel means, said harvester unit including means for mounting said unit on said tractor, said mounting means comprising:

(a) means for mounting said unit on the tractor including means for pivotally connecting the opposite side frame members of said harvester unit to said tractor vehicle,

(b) a support member rigidly mounted on the lower front portion of said tractor vehicle, and

(c) an upright hydraulic power means connected between said support member and the upper rear portion of said harvester unit for vertically raising and lowering said unit between a raised position therefor wherein said ground engaging wheel means provide substantially no support for said harvester unit, and a lowered position therefor wherein said wheel means provide at least partial support for said harvester unit, said power means having:

(1) a hydraulic cylinder having a closed end secured to one of said support member or said harvester unit, and a piston rod; and

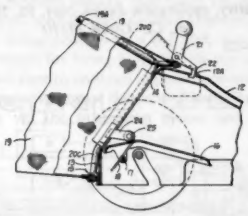
(2) spring means mounted about said piston rod for engagement with the other of said support member or said harvester unit to provide a resilient support for said harvester unit at all moved positions therefor.

4,203,276

LAWN MOWER AND GRASS CATCHER

Gerhard R. Plamper, Valley City, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Aug. 7, 1978, Ser. No. 931,768
Int. Cl.[2] A01D *35/22*
U.S. Cl. 56—202 11 Claims



1. In a lawn mower having grass cutting means, a housing for the grass cutting means, the housing having a wall and a discharge port in said wall through which cut grass is discharged outwardly of the housing, the combination of a movable closure carried by the housing for blocking said discharge opening when in closed position and for opening said discharge port when in opened position, said closure being hingedly connected to the housing adjacent to lower edge portion of the closure and being biased to swing upwardly and rearwardly to

a generally upright position to close said discharge port and to swing downwardly and forwardly into said housing upon overcoming of the said bias, a collector for collecting cut grass discharged through said discharge port upon being mounted upon the said housing adjacent the said discharge port to receive cut grass blown by the cutting means through the discharge port when the discharge port is open, and an operating arm carried by the collector and extending forwardly therefrom to protrude into said discharge port upon the mounting of the collector on the said housing and to press against the said closure to cause the closure to swing in opposition to said bias downwardly and forwardly into the housing for opening said discharge port.

4,203,277

FORKLESS HAYMAKING MACHINE

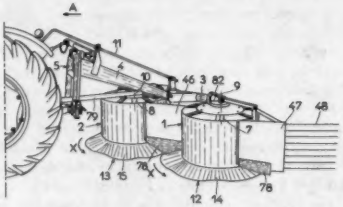
Pierre Kaetzel, Saverne, France, assignor to Samibem, S.A., Marmoutier, France

Filed Oct. 10, 1978, Ser. No. 950,300

Claims priority, application France, Oct. 7, 1977, 77 30787; Jun. 23, 1978, 78 20085; Jul. 27, 1978, 78 22906

Int. Cl.[2] A01D *81/00*

U.S. Cl. 56—377 **97 Claims**



1. A haymaking machine for the windrowing of fodder or the turning of windrows or for tedding, comprising at least one drum rotating about a substantially vertical or inclined axis, said drum (1, 2) carrying at its base a thin flexible and deformable skirt (12, 13) which plunges beneath the fodder to be displaced while closely following the variations of level of the ground, and which transports the said fodder over its upper face.

4,203,278

ALARM ELECTRONIC TIMEPIECE

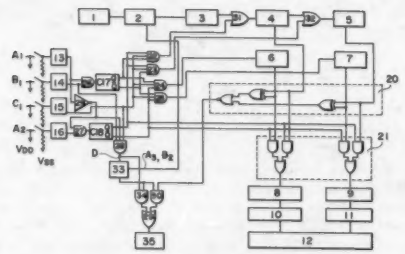
Kenichi Kondo, and Shojiro Komaki, Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 15, 1977, Ser. No. 851,787

Claims priority, application Japan, Nov. 15, 1976, 51-137162

Int. Cl.[2] G04B *23/10*

U.S. Cl. 368—73 **5 Claims**



1. An alarm electronic timepiece, comprising: an oscillator circuit for developing a time standard signal; a dividing circuit for dividing the time standard signal and for developing a plurality of divided output signals; a time counting circuit for counting one of the divided output signals and for developing a count representative of present time; a memory circuit for storing a signal representative of an alarm time; a coincidence detecting circuit for detecting coincidence between present time represented by the count developed by said time counting circuit and the signal stored in said memory circuit and representative of the alarm time and for developing an output coincidence signal; a display for displaying present time represented by the count developed by said counting circuit and for displaying alarm time represented by the signal stored in said memory circuit; alarm means responsive to a divided signal developed by said dividing circuit for generating an alarm sound in response thereto; and alarm operating means operable at will and automatically operative in response to the coincidence signal developed by said coincidence detecting circuit for applying one of the divided signals to said alarm means for generating an alarm sound, said alarm operating means includes a plurality of external switches manually operable by a user of the timepiece for selecting among the divided signals by simultaneous operation of at least a pair of said external switches to set the alarm sound generated by said alarm means according to the divided signal selected.

4,203,279

TIMEPIECE WHICH PERMITS FREELY ADJUSTING THE LEVEL OF SOUNDS PRODUCED THEREIN AND GIVEN OUT THEREOF

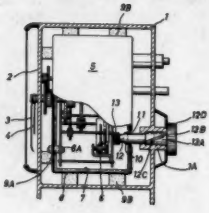
Minoru Kamiya, 46-3, 2-chome, Minami Otsuka, Toshima-ku, Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,932

Claims priority, application Japan, Oct. 31, 1977, 52/130646

Int. Cl.[2] G04B *37/00, 23/10*

U.S. Cl. 368—243 **9 Claims**



1. In a timepiece equipped with a mechanical unit including sound producing means for producing a time-ticking sound, such as an escapement having isochronism,

the improvement comprising,

an outer casing;

a sound proof inner casing within said outer casing, said inner casing containing said mechanical unit; buffer means supporting said inner casing in spaced relation to said outer casing, said buffer means accoustically isolating said inner casing from said outer casing;

sound level adjusting means for conveying sound produced by the mechanical unit from said inner casing, said sound level adjusting means including means for freely adjusting the level of the sound conveyed from said inner casing in a range from a condition of essentially silence to a predetermined level; and

means for enlarging the sound conveyed from the inner casing.

4,203,280

TOUCH SENSITIVE DEVICE FOR A TIMEPIECE

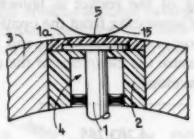
Jacques Ziegler, Bienne; Ali Schneiter, Neuchatel, and Remy Grandjean, Fontainemelon, all of Switzerland, assignors to Ebauches, S.A., Switzerland

Filed Nov. 21, 1978, Ser. No. 962,780

Claims priority, application Switzerland, Nov. 22, 1977, 14371/77

Int. Cl.[2] G04B *37/00*; G08C *1/00*

U.S. Cl. 368—187 6 Claims



1. A touch sensitive device for controlling at least one function of an electronic timepiece, the timepiece including a casing, the device comprising:

an element of the timepiece casing, the element having an opening therethrough from the outside to the inside of the timepiece;

mounting member means formed of electrically insulating material and traversing the opening in the casing element for providing a passageway therein electrically insulated from the casing element;

a stem formed of electrically conductive material traversing the passageway in the mounting member means and being fixed in a position therein, the stem including a head on an end of the stem with a surface adjacent an outside surface of the timepiece to form one electrode of a condenser;

a thin layer of an electrically insulating material covering the outside surface of the stem head to form a dielectric of the condenser;

conductive layer means fixed on a side of the dielectric opposite the outside surface of the one electrode and spaced from the casing element for forming a second electrode of the condenser such that the capacity of the condenser is independent of the area of the stem head covered by a contact to control a function of the timepiece.

4,203,281

ASSEMBLY COMPRISING A TIMEPIECE PALLET ANCHOR AND ITS FRAME

Pierre Béguin, Rochefort, Switzerland, assignor to Portescap, La Chaux-de-Fonds, Switzerland

Filed Apr. 20, 1978, Ser. No. 898,522

Claims priority, application Switzerland, Apr. 21, 1977, 4940/77

Int. Cl.[2] G04B *15/00*

U.S. Cl. 368—124 5 Claims

1. An assembly comprising an escapement timepiece pallet anchor and a frame, said pallet anchor being in the form of one piece of plastic material having a body and three arms extending from said body and being rotatably housed in said frame for rotation about an axis, the assembly further comprising means for limiting the angle of rotation of said pallet anchor relative to said frame, said means comprising two appendices to said pallet anchor situated in at least one space overlying the space occupied by said pallet anchor body, each of said appendices having at least one wall parallel to said axis, said means further comprising at least one fixed part integral with the frame disposed to cooperate with said appendices.

4,203,282

ELECTRIC PENDULUM CLOCK WITH TORSION SPRING

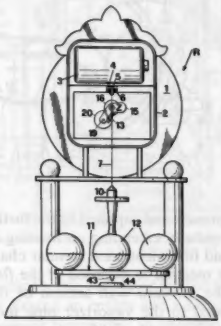
Bruno Radzun, Steibewies 7, 7022 Gottmadingen, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,202

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732667

Int. Cl.[2] G04B *17/10*

U.S. Cl. 368—180 24 Claims



1. In an electrical pendulum clock having a clock movement with a driven shaft and a dummy pendulum driven from the shaft independently of the time keeping function of the clock, the pendulum having a torsion spring with an axis of twist and a pendulum body suspended from the torsion spring, the torsion spring having a projection means adapted for being driven from the shaft of the clock movement and for undergoing pendulous travel with the pendulum body, the improvement comprising drive means driven by the clock movement for twisting the torsion spring including a first toothed element driven in rotation by the shaft of the clock movement, a turnable element loosely suspended for pendulum movement, a second toothed element loosely supported on said turnable element and in mesh with the first toothed element, said second toothed element being positioned in the path of movement of the projection means for being locked with the turnable element thereby, and then to undergo angular movement with the first toothed element to impart the pendulous movement to the pendulum body via the projection means and the torsion spring.

4,203,283

COMBUSTION CHAMBER, ESPECIALLY ANNULAR REVERSE-FLOW COMBUSTION CHAMBER FOR GAS TURBINE ENGINES

Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,464

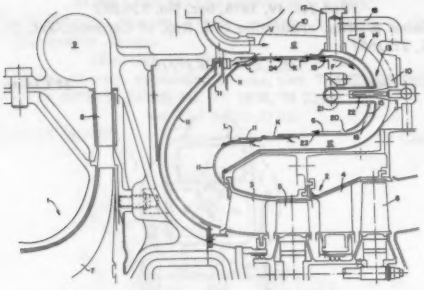
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2723546

Int. Cl.[2] F02C *7/00, 7/12*

U.S. Cl. 60—39.36 5 Claims

1. An annular reverse-flow combustion chamber for gas

turbine engines provided with at least one heat exchanger and a compressor, an annular chamber formed between an outer casing of the combustion chamber and a flame tube, the annular chamber is supplied with preheated air from the heat exchanger with the preheated air being directed to the flame tube for combustion, cooling or other purposes, characterized in that the flame tube includes a flame tube head arranged in a primary combustion zone area of the combustion chamber, the flame tube head includes, as viewed in a direction of flow of the preheated air, a forward wall section and a rearward wall section spaced from each other so as to define therebetween a further annular chamber, means are provided for communicating said further annular chamber to an air bleed line at a discharge end of the compressor such that air is taken directly



from the compressor and supplied to the further annular chamber including radially extending air ducting members projecting through said first-mentioned annular chamber, at least one vaporizer pipe member is disposed at the flame tube head, at least one of the forward wall section or the rearward wall section is welded to the vaporizer pipe member, means are provided at said flame tube for forming a cooling film along at least portions of an inner wall of the flame tube including at least one means for communicating a downstream end of said further annular chamber with the interior of the flame tube, said air ducting members are formed in locating bolts for locating the combustion chamber relative to a casing of the engine, and the locating bolts are arranged on the forward wall section of the flame tube head.

4,203,284

COMBUSTION CHAMBER FOR A RAMJET AND BOOSTER ROCKET

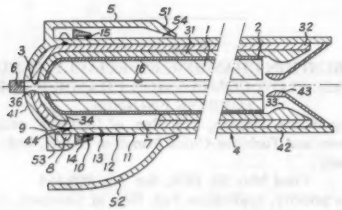
Bernard Luscan, Merignac, and Michel Reichard, Pessac, both of France, assignors to Societe Europeenne de Propulsion, Puteaux, France

Filed Sep. 6, 1978, Ser. No. 940,146

Claims priority, application France, Sep. 7, 1977, 77 27097; Mar. 28, 1978, 78 08958

Int. Cl.[2] F02K *9/04*

U.S. Cl. 60—245 **14 Claims**



1. In a so-called ramjet and booster rocket, a combustion chamber presenting a first speed of propulsion of the rocket type, called launching speed, obtained by the reaction of a fuel and a supporter of combustion disposed in the combustion chamber, and a second speed of propulsion, called cruising speed, for which the supporter of combustion is constituted by atmospheric air, said combustion chamber comprising an inner envelope provided with upstream lateral ports for the inlet of air and a downstream nozzle for ejecting the combustion gases, to allow functioning of the rocket at cruising speed; an outer envelope, concentric to the inner envelope and closed, with the exclusion of a single rear port for the ejection of the gases, to allow functioning of the rocket at launching speed, and separating means for separating from the combustion chamber at least a part of the outer envelope, at the end of the launching phase, in order to ensure the clearance of the upstream lateral ports of the inner envelope.

4,203,285

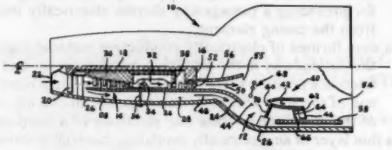
PARTIAL SWIRL AUGMENTOR FOR A TURBOFAN ENGINE

Kurt J. Hanloser, North Palm Beach; Raymond J. Bruchez, Lake Park, and James T. Gill, Jr., North Palm Beach, all of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1978, Ser. No. 875,664

Int. Cl.[2] F02K *3/10*

U.S. Cl. 60—261 **5 Claims**



1. In a turbofan engine having a casing enveloping a compressor, combustor and turbine in axial flow relationship, the improvement therein being in the form of a partial swirl augmentor for providing an additional thrust to said turbofan engine positioned downstream of said turbine, said partial swirl augmentor consisting of a combustion chamber, an inner fairing and an outer fairing, an annular duct formed between said inner fairing and said outer fairing for directing swirling hot gases emanating from said turbine into said combustion chamber, cooler gases being directed between said outer fairing and said casing into said combustion chamber for mixing with said swirling hot gases, means located within said combustion chamber for injecting fuel into said combustion chamber in a preselected manner, a flameholder system, said flameholder system consisting of a vee-gutter pilot and a plurality of radial vee-gutters attached to said pilot, said pilot being located directly adjacent the outer edge of said swirling hot gases and situated substantially in line with said outer fairing and substantially radially disposed from the central longitudinal axis of said duct, said vee-gutters penetrating into said cooler gas and a spark ignition system located adjacent said vee-gutter pilot.

4,203,286

COOLING APPARATUS FOR AN EXHAUST NOZZLE OF A GAS TURBINE ENGINE

Robert E. Warburton, Lake Park, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 718,271, Aug. 27, 1976, abandoned. This application Oct. 30, 1978, Ser. No. 956,305

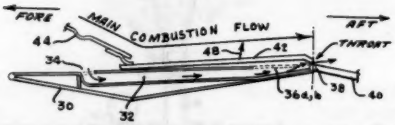
Int. Cl.[2] F02K *1/12*

U.S. Cl. 60—266 **7 Claims**

1. In a jet engine exhaust nozzle, a cooling apparatus comprising in combination:

a. a plurality of flap strings moveable attached to said exhaust nozzle,

a plurality of seal strings moveable attached to said exhaust nozzle, said plurality of seal strings slideably engaging and covering said plurality of flap strings, each seal string being alternately positioned between and on a flap string of said plurality of flap strings, said plurality of flap strings and seal strings being circumferentially disposed about the aft end of said exhaust nozzle to form a controllable convergent/divergent exhaust nozzle, each of said plurality of flap strings in the convergent portion of said convergent-/divergent exhaust nozzle having a cooling passage therein, said cooling passage having an inlet opening and a pair of outlet openings, said inlet opening being in the forward portion of said convergent portion and said pair



of outlet openings being in the aft portion of said convergent portion, and,

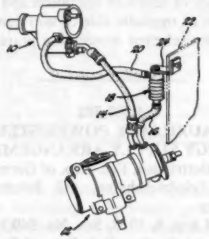
means for controlling said plurality of seal and flap strings, said control means respectively converging and diverging said plurality of seal and flap strings to close said exhaust nozzle to a minimum jet area and to open said exhaust nozzle to a maximum jet area, said plurality of seal strings closing said outlet openings when said exhaust nozzle is closed to minimum jet area, said plurality of seal strings uncovering fully said outlet openings when said exhaust nozzle is opened to maximum jet area, said inlet opening receiving a cooling medium, said cooling medium flowing through said cooling passageway to said outlet openings, said cooling medium flowing out of said outlet openings in proportion to the opening size thereof.

4,203,287

POWER STEERING HYDRAULIC SYSTEM WITH A LOW PRESSURE EXPANSIBLE RESERVOIR

Jack L. Bennett, Reese, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 9, 1979, Ser. No. 19,119
Int. Cl.² F15B *21/04*
U.S. Cl. 60—329 **1 Claim**



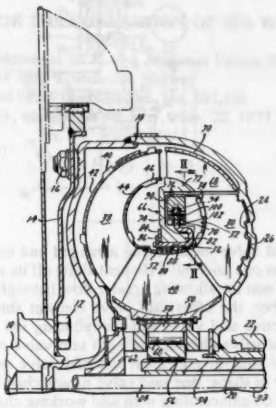
1. An improvement in power steering systems having a hydraulic pump and a steering apparatus with a high pressure hose for delivering fluid from the pump to the steering apparatus and a low pressure return line for directing fluid from the steering apparatus to the pump, said improvement comprising: an expansible chamber in the low pressure return line which changes in storage capacity in response to changes in the volume of fluid in the system occurring as a result of temperature changes whereby said power steering system can be sealed from the atmosphere, said expansible chamber having a fluid outlet; and aspirator means disposed within said expansible chamber adjacent said fluid outlet.

4,203,288

HYDROKINETIC TORQUE CONVERTER MECHANISM WITH COMPOUND IMPELLER

Robert W. Nichols, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1978, Ser. No. 966,974
Int. Cl.² F16D *33/00*
U.S. Cl. 60—345 **12 Claims**



1. A hydrokinetic torque converter for use in an automotive vehicle driveline having an engine and a torque delivery gear system, said converter comprising an impeller, a turbine and a stator arranged in toroidal fluid flow relationship in a torus circuit, said impeller being connected to said engine, said turbine being connected to a torque input element of said gear system, said impeller comprising a main impeller section and an auxiliary impeller section, each section having flow directing blades, the auxiliary section being located radially outward with respect to the main impeller section, and centrifugally operated clutch means for connecting drivably the auxiliary impeller section with the main impeller section, said clutch means comprising a first clutch element carried by said main impeller section, a second radially movable clutch element having formed thereon a friction surface and an annular internal clutch surface carried by said auxiliary blade section in proximity to the friction surface of said second clutch element, means for urging said second clutch element in a radially inward direction thus tending to disengage the clutch means, said second clutch element being moved radially outwardly at speeds greater than a predetermined value to effect friction engagement of said friction surface with said clutch surface.

4,203,289

HYDRODYNAMIC CONTROL COUPLING

Horst Muschelknautz, Crailsheim, Fed. Rep. of Germany, assignor to Voith Turbo GmbH & Co., KG, Crailsheim, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,037
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748386
Int. Cl.² F16D *33/06*
U.S. Cl. 60—358 **14 Claims**

1. A hydrodynamic coupling, comprising:

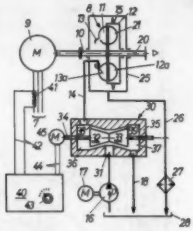
a primary bladed wheel; a secondary bladed wheel, which together with said primary wheel defines a toroidal work-

ing chamber; a draining device for draining working fluid from said working chamber;

a filling pump for supplying working fluid to said working chamber;

a valve between said filling pump and said working chamber for varying the filling flow to said working chamber; said valve being a flow divider type valve, and comprising:

two interconnected valve means, each comprising a valve chamber with a valve seat defined in it and a valve element relatively movable in said valve chamber between a position on and off its respective said valve seat;



both said valve means being arranged and connected such that, as one said valve element shifts off its respective said valve seat for allowing greater flow through its said valve chamber, the other said valve element shifts toward its respective said valve seat for reducing the flow through its said valve chamber; in each said valve means, at least one of said valve element and said valve seat tapers narrower in shape; one said valve means chamber having an outlet communicating with said working chamber and the other said valve means chamber having an outlet communicating elsewhere than with said working chamber.

4,203,290

STEERING VALVE FOR HYDROSTATIC DRIVE

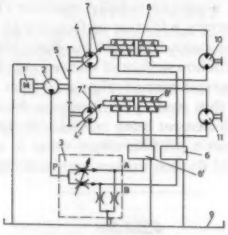
Dieter Burckardt, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,109

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752226

Int. Cl.[2] **F15B** *13/06, 13/09*

U.S. Cl. 60—420 **5 Claims**



1. A steering valve assembly (3) for a vehicle having a steering-by-driving system, including flow divider valve means (15) through which flow is divided under control of a manually operated actuating mechanism (21–23) to operate adjusting devices (7, 7') for pumps (4, 4') supplying fluid to fluid motors (10 and 11), said flow divider valve means including a central portion connected to the actuating mechanism and throttling passage means (16, 17) for dividing inflow into two divided flow streams, a pair of conduits (13, 14) conducting said divided flow streams to the pump adjusting devices, and means connected to said conduits for maintaining a constant ratio between the flow rates of said divided flow streams, including variable flow restricting passages (33, 34) connected to the conduits downstream of the throttling passage means, and secondary throttling means (37, 38) interconnecting the conduits for regulating pressure therein.

4,203,291

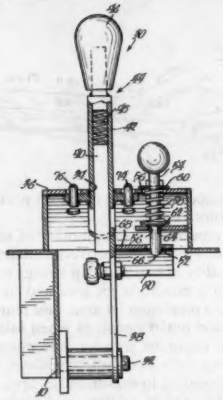
CONTROL MECHANISM FOR HYDROSTATIC PUMP

Stephen A. Youngers, Clearwater, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 29, 1979, Ser. No. 25,019

Int. Cl.[2] **F15B** *11/16*

U.S. Cl. 60—433 **14 Claims**



1. In a vehicle having a reversible pump supplying hydraulic fluid to at least two motors controlling separate functions with selector means between said motors and said pump for selecting one function, said pump having a control arm movable in opposite directions from a neutral position, a control unit including a control lever pivoted on a fixed axis on said vehicle and having said arm connected thereto, releasable interlock means between said control lever and said vehicle defining a neutral position for said arm, a control console adjacent said control lever, said control console and control lever having a first position defining means defining a plurality of positions on one side of said neutral position for operating one selected motor at a plurality of levels of operation and second position defining means on an opposite side of said neutral position for operating the other selected motor at a plurality of levels of operation.

4,203,292

HYDRAULIC AUXILIARY POWER STEERING WITH ENERGY SUPPLY ARRANGEMENT

Horst Deininger, Bettringen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 940,130

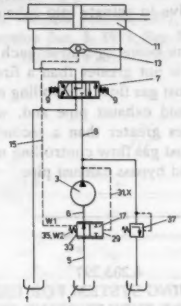
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742621

Int. Cl.[2] **F16H** *39/46*

U.S. Cl. 60—445 **10 Claims**

1. In a power steering system having a fluid supply which includes an intake duct (5, 6) connected to a high pressure pump (3, 3a) supplying operating fluid limited to a maximum discharge pressure by a pressure limiting valve (37, 37') and a control valve (7) displaceable from a flow-blocking position by an actuating mechanism to operate a servomotor (11) having operating pressure chambers, the improvement residing in

regulator means (17, 17', 17*a*) connected to the intake duct for controlling the discharge pressure of the high pressure pump as a function of one influence (x) balanced by the sum of two command variables (W1, W2), and signal means for establishing a higher one of said variables (W1) normally corresponding to the operating pressure prevailing one of the pressure chambers of the servomotor, the other of said variables (W2) corresponding to a relatively lower adjustable idling bias.

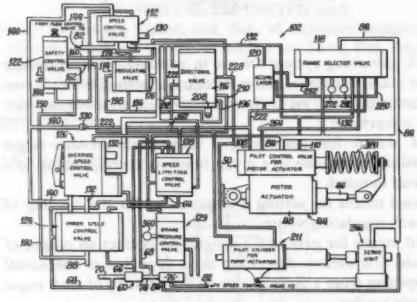


4,203,293

CONTROLS FOR COMBINED HYDROSTATIC AND MULTIPLE SPEED RANGE TRANSMISSION UNITS WITH AUTOMATIC SPEED CONTROL AND BRAKING FUNCTIONS

Thomas J. Bubula, Joliet; Maurice F. Franz, East Peoria; Gordon W. Johnson, Peoria, and James D. Rinaldo, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 609,637, Sep. 2, 1975, Pat. No. 4,080,850.
This application Oct. 25, 1977, Ser. No. 844,662
Int. Cl.[2] F16H *39/10*
U.S. Cl. 60—490 **8 Claims**



1. A control assembly for regulating operation of a hydrostatic transmission including a hydraulic pump having infinitely variable displacement and a hydraulic motor also having infinitely variable displacement, the hydrostatic transmission providing a coupling between a prime mover and a primary output shaft within a drive train, the control assembly comprising

a manually operable control means producing a modulated signal representative of a desired rate of operation for the drive train, and

a directional selector means operatively coupling the manually operable control means with both of the hydraulic pump and hydraulic motor within the hydrostatic transmission, the directional selector means including

means for selectively establishing the direction of travel for the primary output shaft through operation of the hydrostatic transmission in both forward and reverse modes,

means to sequence displacement variation of the hydraulic pump and hydraulic motor, and

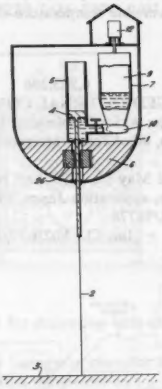
means to selectively establish a deceleration rate toward an intervening neutral condition when the hydrostatic transmission is shifted between forward and reverse operating modes in order to permit such shifts from forward to reverse and from reverse to forward without necessarily resetting the manually operable control means.

4,203,294

SYSTEM FOR THE CONVERSION OF SEA WAVE ENERGY

Kjell Budal, Planetvegen 33 B, and Johannes Falnes, Planetvegen 52, both of 7000 Trondheim, Norway

Filed Mar. 16, 1978, Ser. No. 887,128
Claims priority, application Norway, Mar. 22, 1977, 771013
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—497 **6 Claims**



1. Apparatus for conversion of sea wave energy comprising a water displacing member which is adapted to be at least partially submerged in the sea, means for mechanically connecting said water displacing member to a fixed reference point, said connection means between said member and said reference point includes a locking mechanism adapted to hold said water displacing member at least approximately stationary relative to said reference point during selected time periods of each cycle of such waves to which the apparatus is subjected.

4,203,295

SPACE REVERSIBLE DIFFERENTIAL TEMPERATURE ENGINE

Israel Siegel, 351 W. 71 St., New York, N.Y. 10023

Filed Sep. 23, 1977, Ser. No. 835,984
Int. Cl.[2] F03G *7/02, 7/06*
U.S. Cl. 60—531 **2 Claims**

1. A reversible differential temperature engine comprising at least two chambers,

inside of said chambers being sealed from the outside environment,

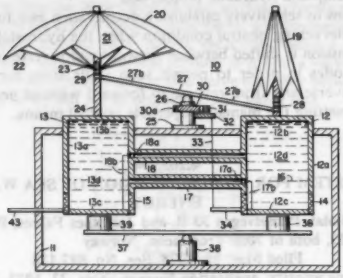
a supply of evaporating liquid disposed within said chambers to exert a vapor pressure within said chambers,

each of said chambers having a moveable member responsive to the vapor pressure changes within the chambers,

vapor connecting means for the intermittent placing of the respective vapor portions of the chambers into communication,

valve means for opening and closing said vapor communication,

means to alternately synchronize the operation of said valve means with the movement of each moving member of each chamber,



and means to alternately heat and cool each chamber to obtain a reversible temperature differential between the chambers.

4,203,296

SUPERCHARGED INTERNAL COMBUSTION ENGINE

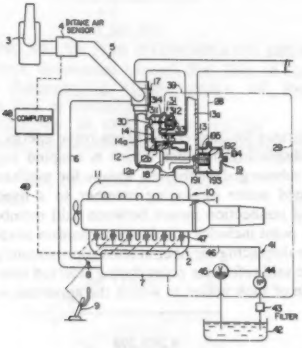
Eizi Tanaka, Anjo; Akira Nishimatsu, Okazaki, and Michiniro Ohashi, Handa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 19, 1978, Ser. No. 907,859

Claims priority, application Japan, May 23, 1977, 52/60314; Jun. 27, 1977, 52/76776

Int. Cl.² F02B *37/00*

U.S. Cl. 60—602 **5 Claims**



1. A supercharged internal combustion engine comprising:

an intake system including an intake duct for feeding air into engine cylinders;

a throttle valve pivotally mounted in said intake duct to control the rate of air flow therethrough;

an exhaust system for discharging engine exhaust gases into the atmosphere;

said exhaust system including an exhaust pipe;

a supercharger mounted on said exhaust pipe and driven by the flow of the engine exhaust gases therethrough to produce and feed pressurized air into the engine cylinders;

said exhaust system further including a bypass exhaust pipe bypassing said supercharger and having an upstream end connected to said exhaust pipe at a point upstream of said supercharger;

means disposed in said exhaust system adjacent to said point and being operative to open and close said exhaust pipe and said bypass exhaust pipe for thereby controlling the flow of engine exhaust gases into sand through said exhaust pipe and said bypass exhaust pipe; and

control means operatively associated with said exhaust gas flow controlling means and being responsive to variation in the intake pressure in said intake system downstream of said throttle valve to actuate said exhaust gas flow controlling means;

said control means being operative such that, when the intake pressure is not greater than a first predetermined value, said exhaust gas flow controlling means is actuated to fully close said exhaust pipe and, when said intake pressure becomes greater than a second predetermined value, said exhaust gas flow controlling means is actuated to fully close said bypass exhaust pipe.

4,203,297

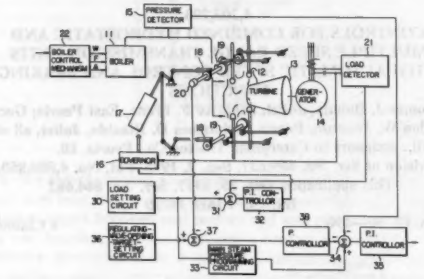
GOVERNING SYSTEM FOR USE IN SLIDING-PRESSURE TYPE TURBINE POWER PLANT

Akira Sakai, Tokyo, and Jube Matsumura, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1978, Ser. No. 910,346

Int. Cl.² F01K *13/02*

U.S. Cl. 60—660 **7 Claims**



1. A governing system for use in a sliding-pressure turbine power plant, wherein steam is introduced from a boiler via two or more regulating valves to a turbine so as to drive said turbine, comprising;

first means for generating a main-steam-pressure-target value in response to a given function corresponding to a load demand;

second means for setting a target value for the opening of each regulating valve;

third means for generating a signal to correct an output of said first means, depending on a deviation of the actual opening from a target value of the opening of each regulating valve;

fourth means for controlling the operating mechanism of a boiler in a manner that a corrected value of an output of said first means according to an output of said third means may be brought into coincidence with a detected value of the main steam pressure;

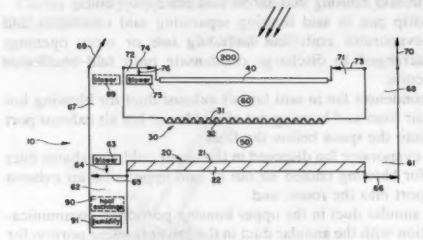
fifth means for generating a valve positioning signal, commensurate with a deviation of an actual load from a load demand;

sixth means for driving respective regulating valves in a manner that two or more regulating valves may be opened at least to respective warming openings at a time, commensurate with the magnitude of an output of said fifth means, after which respective regulating valves may be opened one after another in an opening range beyond said warming opening.

4,203,298
SOLAR AIR CONDITIONING METHOD AND APPARATUS

William E. Glenn, Jr., Ft. Lauderdale, and Carl A. Ludeke, Dania, both of Fla., assignors to New York Institute of Technology, Old Westbury, N.Y.

Division of Ser. No. 768,058, Feb. 14, 1977, Pat. No. 4,121,428.
This application Jun. 5, 1978, Ser. No. 912,429
Int. Cl.[2] F25B 27/00
U.S. Cl. 62—2 14 Claims

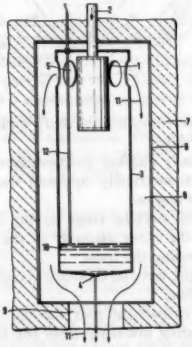


1. A method for cooling internal environment air using energy from the sun, comprising the steps of:
circulating internal environment air over a desiccant to dry the internal environment air;
cooling the dried room air by performing a heat exchange operation with external environment air;
adding moisture to the dried internal environment air which was subjected to the heat exchange operation;
heating the desiccant with solar energy so as to remove moisture from the desiccant; and
cooling the desiccant by performing a heat exchange with external environment air.

4,203,299
APPARATUS FOR METERING SMALL AMOUNTS OF A LOW BOILING LIQUEFIED GAS

Gunter Dinglinger, Kaarst, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,184
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732318
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—49 6 Claims

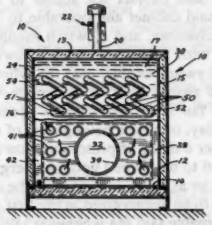


1. In an apparatus for metering from a metering position small amounts of a low boiling liquefied gas which are returned by means of a pipeline to the metering position, the improvement being said pipeline exiting in an internally hollow sintered metal body, said body being mounted inside an inner container, said inner container having a drain hole for liquefied gas at its bottom and at least one discharge opening for evaporated gas in its upper portion thereof, said inner container being surrounded by an outer container, said outer container being provided with an insulation, an intermdiate space being between said containers, and said space communicating with a gas discharge opening in said outer container underneath said drain hole for liquefied gas.

4,203,300
HORIZONTAL DIRECT FIRED WATER BATH PROPANE VAPORIZER

Robert C. Hanson, Excelsior, and Leon C. Hanson, Bloomington, both of Minn., assignors to Energy Systems Incorporated, Eden Prairie, Minn.

Filed Oct. 25, 1977, Ser. No. 844,634
Int. Cl.[2] F22B 1/16; F17C 9/02
U.S. Cl. 62—52 1 Claim



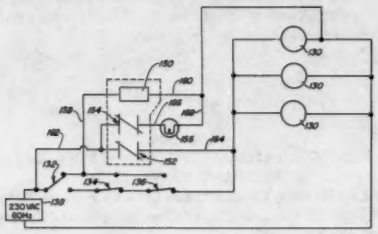
1. A heat transfer unit for delivering heat energy to a fluid, said unit including:
A. a horizontal water vaporizer chamber having a major horizontal longitudinal dimension and a lower, heat receiving portion open to an upper heat delivering portion, said vaporizer chamber being partially defined by first and second parallel, upright, longitudinally extending side walls;
B. a water bath filling said vaporizer chamber;
C. means including horizontally and longitudinally extending heat sources in said lower portion of said vaporizer chamber and surrounded by said water bath for delivering heat energy to said water bath;
D. a heat exchange network of hollow, generally horizontally and longitudinally extending mutually substantially parallel heat transfer pipes in said upper portion of said vaporizer chamber and surrounded by said water bath, each of said pipes forming a part of a series connected heat transfer coil, each such coil extending from a lower inlet coil end thereof progressively upward to an upper outlet coil end;
E. an inlet pipe extending from outside the vaporizer chamber to connect with the inlet coil end of each of such heat transfer coils to carry a fluid to be heated into said network;
F. an outlet pipe extending from each of said outlet coil ends to the outside of the vaporizer chamber to carry said fluid away from said network after it has been heated; and
G. the effective average path of fluid through each of said coils being from position adjacent the bottom of the upper portion of the vaporizer chamber and nearer to said first vaporizer chamber side wall to position closer to the top of said upper portion and nearer to said second vaporizer chamber side wall.

4,203,301

CONTROL CIRCUIT FOR REFRIGERATOR FAN

Harnek S. Gill, Huntsville, and Charles R. Turner, Decatur, both of Ala., assignors to Schaefer Corporation, Madison, Ala.

Filed Feb. 16, 1979, Ser. No. 12,617
Int. Cl.[2] F25D *17/06*; F25B *49/00*
U.S. Cl. 62—131 **8 Claims**



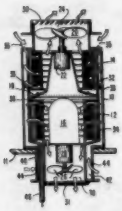
1. In a refrigerator of a type comprising a cabinet, means to refrigerate contents of a chamber within said cabinet, a door mounted to said cabinet for access to said chamber, a fan disposed in said cabinet and operable to force air to circulate within said chamber, and a switch mounted for operation of said switch with said door so as to switch to a first mode wherein said switch enables said fan when said door is closed and so as to switch to a second mode wherein said switch disables said fan when said door is opened, an improvement wherein a relay, of a type having a set of contacts arranged to be closed after a delay of preset duration from energization of said relay and to be opened upon deenergization of said relay, is connected so as to be energized in the second mode of said switch, so as to be deenergized in the first mode of said switch, and so as to enable said fan whenever said contacts are closed.

4,203,302

FLOOR MOUNTED AIR CONDITIONER

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jul. 14, 1978, Ser. No. 924,823
Int. Cl.[2] F25D *23/12*; F25B *47/00*; F25D *21/14*
U.S. Cl. 62—259 **6 Claims**



1. A floor mounted air conditioner comprising:

a housing having a lower portion and an upper portion, the lower portion of the housing including a cylindrical wall insertable into a mounting opening in the floor of a room to be cooled, the upper portion of the housing being disposable above the floor and having a cold air exhaust duct upwardly extending from the upper portion and terminating in an upper cold air exhaust port;

an annular inlet at the top of the upper portion of said housing for drawing air from the room into the housing for cooling, said annular inlet surrounding and spaced from said upper cold air exhaust port;

a hot air exhaust duct in the lower portion of said housing terminating in a lower hot air exhaust port at the bottom end of the lower housing portion below the mounting floor;

an annular duct in the lower housing portion defined by the wall of the lower housing portion and the hot air exhaust duct and having inlet openings in the wall of the lower housing portion into which air is drawn from below the floor into the housing for cooling;

a compressor within the housing;

cylindrical condenser coils disposed about a vertical axis in the housing;

cylindrical evaporator coils disposed about said vertical axis in said housing and above said condenser coils;

a drip pan in said housing separating said condenser and evaporator coils and including one or more openings arranged to discharge condensate onto said condenser coils;

a condenser fan in said hot air exhaust duct for blowing hot air from said housing out of said lower hot air exhaust port into the space below the floor;

an evaporator fan disposed in the upper cold air exhaust duct for blowing cooled air out of said upper cold air exhaust port into the room; and

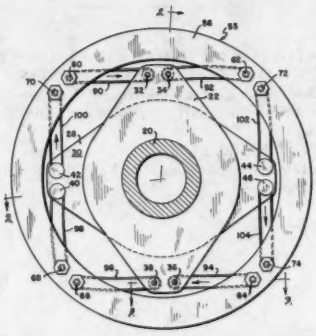
an annular duct in the upper housing portion in communication with the annular duct in the lower housing portion for directing air from the annular inlet over the evaporator coils and air from the inlet openings in the wall of the lower housing portion over the evaporator coils.

4,203,303

TORQUE-BALANCED VIBRATIONLESS ROTARY COUPLING

Donald M. Miller, Sunnyside, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1978, Ser. No. 929,134
Int. Cl.[2] F16D *3/50*
U.S. Cl. 64—12 **3 Claims**



1. A coupling for transmitting rotary motion from one shaft to another comprising,

two spaced, axially aligned, shaft-engaging hubs, each provided with diametrically opposed flanges, said flanges being at right angles,

a pair of spaced, parallel rings having an inner diameter greater than the outer diameter of the flanged hubs disposed surrounding the hubs,

a plurality of right, circular cylindrical pins joining said rings one to the other,

right, circular cylindrical pins having a lip at the edge thereof extending inwardly from the flanges on each of said hubs toward the other hub,

strong, flexible lightweight belts of equal length connecting the pins on the flanges with the pins joining the rings, said belts being essentially all in a single plane,

said pins and belts being constructed and arranged to be slack when not under tension and, when under tension, to provide equal, tangential pull on opposite sides of the coupling.

4,203,304

FLEXIBLE SHAFT COUPLING

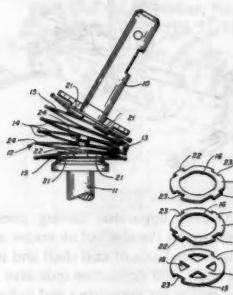
Herbert Decker, Lauf, Fed. Rep. of Germany, assignor to Triumph Werke Nurnberg A.G., Nuremberg, Del.X

Filed Nov. 8, 1978, Ser. No. 958,686

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750988

Int. Cl.[2] F16D *3/78*

U.S. Cl. 64—13 **3 Claims**



1. For use in small precision applications a flexible coupling between a drive shaft and a driven shaft for transmitting torque from said drive shaft to said driven shaft while allowing a change in the axial orientation of said driven shaft relative to the axis of said drive shaft,

said flexible coupling comprising an axially stacked series of interconnected flexible discs, the interconnection between adjacent discs being at oppositely spaced peripheral points with the interconnection of one disc to a neighboring disc on one side being displaced 90° from its interconnection with a neighboring disc on its other side

said interconnections comprising interfitting peripheral formations on said discs directly interlockingly connecting said discs to one another.

and central formations on said first and last discs in the series for connection to said drive shaft and driven shaft, respectively.

4,203,305

FLEXIBLE COUPLING

Richard H. Williams, 18320-4 Oxnard St., Tarzana, Calif. 91356

Continuation-in-part of Ser. No. 752,111, Dec. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 643,231, Dec. 22, 1975, abandoned, which is a continuation of Ser. No. 454,602, Mar. 25, 1974, abandoned. This application Dec. 13, 1978, Ser. No. 968,997

Int. Cl.[2] F16D *3/52*

U.S. Cl. 64—15 R **4 Claims**

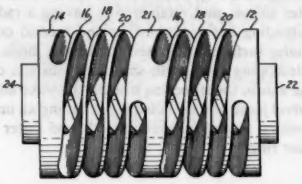
1. A flexible coupling for torque transmission comprising

a unitary structure having a pair of ends and drive shafts attached to the ends;

a plurality of helical beams integral with one of said ends and extending to the other of said ends and being integral therewith, each of said beams being formed about a common axis so as to have an inner diameter face having a first predetermined thickness and an outer diameter face having a second predetermined thickness, and having a beam depth defined by the distance between the inner and outer faces of said beams, said beams spiralling outwardly from the one of said end to which a shaft to drive the coupling is to be attached, said spiral being in a first rotational sense which is opposite to a second rotational sense; and

in which the ratio of thicknesses of the inner diameter faces to the outer diameter faces is selected to be within the range of from 2:1 to 3:1, the ratio of beam depth to mean beam thickness is about 13.5:1, and the depths and beam thicknesses are defined by the equation

$$d_o/d_i=(b_i/b_o)^{1.55}$$



wherein

d_o is the outer diameter of the helical beam,

d_i is the inner diameter of the helical beam,

b_o is the thickness of the beam at its outer diameter,

b_i is the thickness of the beam at its inner diameter, and mean beam thickness is defined by $(b_i+b_o)/2$;

whereby the coupling will fail elastically and in buckling substantially simultaneously when rotated in the first rotational sense.

4,203,306

TELESCOPING POWER TAKE-OFF SHAFT WITH LOCKABLE LENGTH ADJUSTMENT

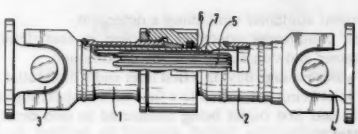
Gerd Sehlbach, and Ditmar Klischat, both of Essen, Fed. Rep. of Germany, assignors to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,323

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747319

Int. Cl.[2] F16D *3/06*

U.S. Cl. 64—23 **8 Claims**



1. Telescoping power take-off shaft comprising a first swivel joint, a second swivel joint spaced from said first swivel joint, an axially extending telescoping shaft extending between said first and second swivel joints and a yoke on each end of said shaft for interconnecting said shaft to said joints, said telescoping shaft comprises an inner shaft connected to said yoke adjacent said first swivel joint, and an outer shaft connected to said yoke adjacent said second swivel joint, said outer shaft having an axially extending hollow portion forming a bore into which said inner shaft extends, each of said inner shaft and outer shaft has an axially extending spline section for interconnecting said shafts and affording longitudinal adjustment of the interconnection, wherein the improvement comprises an adapter sleeve attached to said yoke adjacent said first swivel joint and extending therefrom and laterally enclosing at least an axially extending part of said outer shaft, said adapter sleeve having a free end spaced axially from said yoke to which it is attached, a clamp nut laterally enclosing and in threaded engagement with the free end of said adapter sleeve, said clamp nut extending axially from the free end of said adapter sleeve

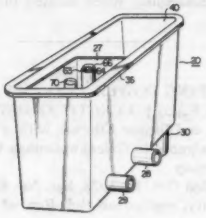
toward said yoke adjacent said second swivel joint, a retainer ring encircling and mounted on said outer shaft and located within said clamp nut, said retainer ring having an axial bore with the surface of the bore in contact with the outer surface of said outer shaft, said retainer ring having a first end extending transversely of the axis of said telescoping shaft and located closer to the yoke adjacent said first swivel joint and a second end extending transversely of the axis of said telescoping joint and located closer to the yoke adjacent said second swivel joint, said first end disposed in contact with said free end of said adapter sleeve, said retainer ring having a radially outer surface extending between the first and second ends thereof and said outer surface is disposed at an acute angle to the axis of said telescoping shaft with said outer surface converging toward the axis in the direction toward the yoke adjacent said second swivel joint, and said clamp nut having an inner surface complementary to and in contact with said outer surface of said retainer ring.

4,203,307

DETERGENT SUPPLYING DEVICE OF A WASHING MACHINE

Yukio Obata, and Masayuki Fujisaki, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 9, 1979, Ser. No. 37,507
Claims priority, application Japan, May 10, 1978, 53/54520
Int. Cl.[2] D06F *39/02*
U.S. Cl. 68—17 R **5 Claims**



1. A detergent supplying device of a washing machine comprising:

a detergent container containing a detergent;

a fabric conditioner container disposed in said detergent container and containing a fabric conditioner;

a first water passage having a first inlet and a first outlet, said first inlet being connected to a first water supplying valve, while said first outlet being connected to said detergent container;

a second water passage having a second inlet and a second outlet, said second inlet being connected to a second water supplying valve, while said second outlet being connected to a discharging passage, said second water passage crossing said first water passage;

a water conduit having an intake port and a third outlet, said intake port being disposed in a crossing passage where said first and second water passages cross each other, while said third outlet being connected to said fabric conditioner container, said intake port being adapted not to take the water into said water conduit when the water is supplied through either one of said first and second passages but to take the water into said water conduit when the water is supplied simultaneously through both of said first and second water passages, the water taken into said water conduit being supplied to said fabric conditioner container;

a siphon device disposed in said fabric conditioner container and adapted to discharge the water into said discharging passage when the water level in said fabric conditioner container has come to exceed a predetermined level;

a third water passage connected between said detergent container and said discharging passage; and

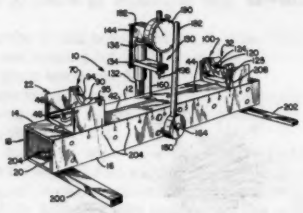
a fourth water passage adapted to introduce the water discharged into said discharging passage to a washing basin.

4,203,308

APPARATUS FOR TESTING AND STRAIGHTENING ARROW SHAFTS AND THE LIKE

Duane L. Davis, 1712 Spruce Ave., Longmont, Colo. 80501

Filed Mar. 7, 1978, Ser. No. 884,114
Int. Cl.[2] B21D *3/16*
U.S. Cl. 72—34 **19 Claims**



1. In arrow straightener apparatus having press means adapted to apply a pressure on the shaft of an arrow in a direction normal to the longitudinal axis of said shaft and in a direction to straighten said shaft, and deflection indicator means in proximity to said press means for measuring and indicating the deviation of the arrow shaft from its normally straight longitudinal axis, the improvement comprising:

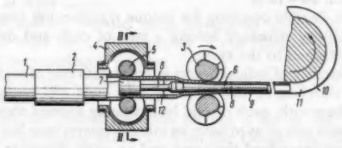
a pair of arrow supports in axially spaced-apart relation to each other, each of said supports including a a pair of bearings with circular cylindrical peripheral surfaces mounted in tandem in a mounting block on respective axes parallel to each other and to a vertical plane extending through both of said supports between said bearings in each of said supports, the peripheral surfaces of said bearings being adapted to support the arrow shaft during straightening operation, and said mounting block being adapted to swivel about an axis normal to said vertical plane to permit said bearing peripheral surfaces to be aligned flush with the surface of said arrow shaft.

4,203,309

METHOD OF PILGER ROLLING OF TUBES

Vladimir E. Ermakov, ulitsa Osipenko, 52a, kv. 1, Moscow; Viktor B. Makarov, ulitsa Zelenaya, 4, kv. 12, Khimki Moskovskoi oblasti; Fikrat S. O. Seidaliev, ulitsa Golovacheva, 17, kv. 125, Moscow; Alexandr M. Nikiforov, ulitsa Zamshina, 25, kv. 21, Leningrad; Alexandr V. Bushev, ulitsa Sevanskaya, 7, korpus 2, kv. 324, Moscow, and July K. Dozortsev, ulitsa Sadovaya, 16, kv. 4, Vidnoe Moskovskoi oblasti, all of U.S.S.R.

Filed Oct. 20, 1977, Ser. No. 843,821
Int. Cl.[2] B21B *17/06, 17/12, 21/00*
U.S. Cl. 72—96 **5 Claims**



1. A method of pilger rolling of tubes, comprising the steps of feeding a billet in portions into pilger rolls and working said billet on a mandrel during each rolling period with said billet

being positively turned about the rolling axis both in one direction and in the opposite direction over the entire rolling period during its deformation and in the off-contact time, when said billet comes out of engagement with said rolls; whereby the rolling of tubes of hard-to-form metals and alloys is practicable and whereby their properties are enhanced.

4,203,310

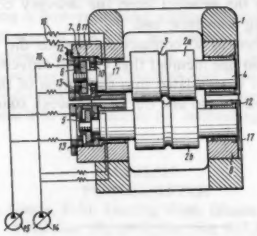
MILL STAND ROLL ASSEMBLY

Nikolai I. Krylov, 1 Novokuzminskaya ulitsa, 25, kv. 26, Moscow; Ilya A. Toder, Ljubertsy, Oktyabrsky prospekt, 339-a, kv. 8, Moskovskaya oblast; Oleg F. Sidorov, ulitsa Kravchenko, 10, kv. 90, Moscow; Gennady I. Tarabaev, Elektrostal, Juzhny prospekt, 3, korpus 4, kv. 74, Moskovskaya oblast, and Gennady I. Pinsky, ulitsa Parkovaya, 38, kv. 37, Cherepovets, all of U.S.S.R.

Filed Dec. 28, 1978, Ser. No. 973,869

Int. Cl.² B21B *31/18*

U.S. Cl. 72—247 **1 Claim**



1. A roll assembly comprising: a roll housing; chocks secured on said housing; thrust hydrostatic bearings mounted in said chocks; grooved rolls having necks formed with thrust shoulders and mounted in said thrust hydrostatic bearings, said thrust shoulders having end faces; drive means for said grooved rolls; thrust disks of said thrust hydrostatic bearings each provided on said faces of said thrust shoulder substantially parallel thereto; opposite sides of said thrust disks facing said end faces of said thrust shoulder; hydrostatic pockets formed on said opposite sides of said thrust disks; a variable delivery fluid source, said fluid source communicating with said hydrostatic pockets of one of said thrust disks of one of said thrust hydrostatic bearings of one of said grooved rolls and of the oppositely disposed other of said thrust disks of another of said thrust hydrostatic bearings of another of said grooved rolls; another fluid source of adjustable delivery; said another fluid source communicating with said hydrostatic pockets of the remaining of said thrust disks of one and another said thrust hydrostatic bearings; by varying the delivery of said fluid source and the delivery of said another fluid source, it is possible to adjust mutually the disposition of each of said thrust shoulders with respect to the corresponding one of said thrust disks for effecting an adjustment of the mutual disposition of said grooved rolls.

4,203,311

TUBULAR ARTICLES OF MANUFACTURE AND METHOD OF MAKING SAME

Joseph M. O'Connor, Chicago, and Stephen F. Pasternak, Park Ridge, both of Ill., assignors to Peerless of America, Inc., Chicago, Ill.

Filed Mar. 27, 1978, Ser. No. 890,539

Int. Cl.² B21D *53/06*

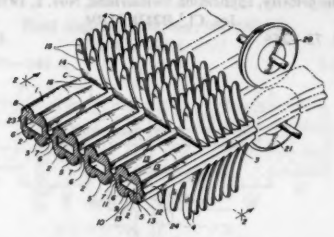
U.S. Cl. 72—254 **6 Claims**

1. The method of making a tubular article of manufacture comprising

a. forming an elongated tubular member comprising

(1) a plurality of elongated tubes extending longitudinally of said tubular member and disposed in side-by-side relation to each other, and

(2) connector means extending between adjacent ones of said tubes for holding said tubes together to form a single unitary structure, and



b. thereafter forming fins on the exteriors of said tubes, and

c. thereafter separating at least certain of said tubes from each other along said connector means extending therebetween.

4,203,312

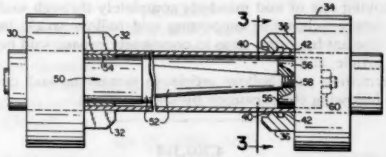
CORRUGATED TUBING WITH VARIABLE DEPTH CORRUGATIONS AND METHOD OF MAKING THE SAME

Robert W. Perkins, Hamden, Conn., assignor to Spiral Tubing Corporation, New Britain, Conn.

Division of Ser. No. 837,718, Sep. 29, 1977. This application Oct. 3, 1978, Ser. No. 948,256

Int. Cl.² B21D *15/00*

U.S. Cl. 72—299 **7 Claims**



1. A method of forming helical corrugations of varying depth in a tube comprising the steps of:

providing a tube having a deformable tube wall disposed about a tube axis;

stressing the tube wall at a plurality of locations in a plane transverse to the tube axis;

positioning an elongated mandrel tapered along one portion of its length within the tube with the tapered portion located inside at least one section of the tube; and

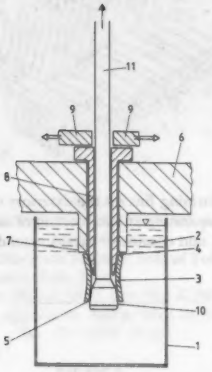
simultaneously twisting and applying axially directed forces to the tube while the tapered portion of the mandrel is axially held in position in said one section of the tube to cause the tube wall to deform and progressively develop helical corrugations in final form at the stressed locations of the tube wall and then along the tube in the tube section overlying the tapered portion of the mandrel whereby the tapered portion of the mandrel makes contact with and limits the inward deformation of the tube wall in said one section of the tube only after the final depth of the corrugations is reached, and varies the final depth of the corrugations along said one section of the tube.

4,203,313

METHOD AND APPARATUS FOR THE EXPANSION OF A HOLLOW ARTICLE

Roland Kunzli, Mellingen; Keith Melton, Busslingen, and Olivier Mercier, Ennetbaden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 20, 1978, Ser. No. 971,634
Claims priority, application Switzerland, Nov. 1, 1978, 264/78
Int. Cl.[2] B21D *31/04*
U.S. Cl. 72—364 **13 Claims**



1. A process for expanding a joining sleeve formed from a hollow article, said process comprising the steps of:

mounting said hollow article between a pair of mandrels having opposing tapers and moveable towards each other, the inner surface of said hollow article being contacted at opposite ends by said mandrels;

inserting said mandrels and hollow article into a coolant until said hollow article reaches its deformation temperature; relatively moving said mandrels toward each other in said coolant to expand said ends;

moving one of said mandrels completely through said hollow article while supporting said hollow article in said coolant by a stop so as to completely expand said hollow article; and

permitting said hollow article to remain in said coolant following the expansion by said mandrels.

4,203,314

POSITIVE TRANSFER MEANS BETWEEN TWO INDEPENDENTLY DRIVEN MECHANICAL PRESSES

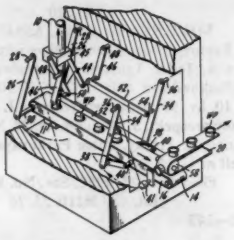
Robert P. Vandlik, Mt. Prospect, and Frank J. Herdzina, Schaumburg, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed May 19, 1978, Ser. No. 907,487
Int. Cl.[2] B21D *45/04*; B30B *15/32*
U.S. Cl. 72—427 **5 Claims**

1. In a cyclically operable machine where a starting blank of metal is worked into a work product at a work station by complementally configured punch and die members of which one member is reciprocal vertically between a lowered working position where the metal blank is deformed and an elevated position where the work product is ejected:

a driven, endless delivery conveyor belt supported by a frame for receiving and delivering the ejected product out of the work station; a plurality of suspension arms mounted on fixed pivots, said suspension arms comprising a first pair of arms pivotally connected directly to the end of the frame adjacent the work station, and a second pair of arms connected to the frame near its delivery end by lost motion swing links, said second pair of suspension arms supporting said frame for movement along a generally horizontal path so that one end of the endless delivery conveyor belt may be swung into and out of receiving positon beneath said one member to receive and deliver the ejected product, with the delivery end of the frame being slidably engaged in fixed, horizontal guide tracks;

a receiving conveyor belt adjacent the end of the delivery conveyor belt opposite the work station, and means for



transferring the product from the delivery conveyor to the receiving conveyor; and

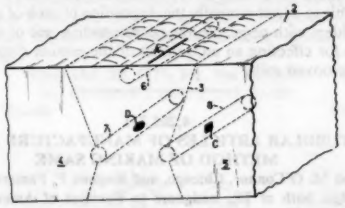
a drive link system so connected between the suspension arms and said one member that vertical movement of said one member is translated into oscillation of the delivery conveyor frame into and out of said work station.

4,203,315

REFERENCE PART, ESPECIALLY FOR NONDESTRUCTIVE TESTING BY ULTRASONIC VIBRATIONS, AND A METHOD FOR THE FABRICATION OF SAID PART

Alain Vieu, Longueil Ste. Marie, and Christian Flambard, Aumont-Senlis, both of France, assignors to Framatome, Courbevoie and Centre Technique des Industries Mechaniques, Senlis, both of, France

Filed Apr. 6, 1979, Ser. No. 27,985
Claims priority, application France, Apr. 19, 1978, 78 11474
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—1 R **12 Claims**



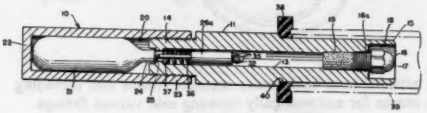
1. A reference part, especially for nondestructive testing by ultrasonic vibrations, wherein said part is fitted with an element having a surface of revolution and provided with a predetermined defect, said element being inserted within said part so as to be applied in intimate contact therewith around its entire periphery.

4,203,316

DEVICE AND METHOD FOR CALIBRATING PULMONARY FUNCTION TESTING EQUIPMENT

William C. Jones, Oak Brook, Ill., assignor to Jones Medical Instrument Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 947,195, Sep. 29, 1978, abandoned. This application May 9, 1979, Ser. No. 37,409
Int. Cl.[2] G01F *25/00*
U.S. Cl. 73—3 37 Claims



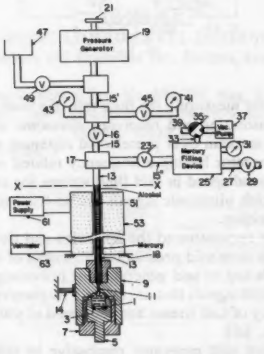
1. A device for calibrating pulmonary function testing equipment comprising a container defining a chamber for containing a predetermined volume of gas at a preselected pressure, gas discharge conduit means communicating with said container and including a flow-restricting orifice of predetermined size for the discharge of gas from said chamber, and means normally preventing said discharge of gas but being selectively operable to release said gas through said flow-restricting orifice at reproducible and substantially exponentially diminishing flow rates into a spirometer for calibrating the same.

4,203,317

POROSIMETER

Krishna M. Gupta, F-24, Lansing West, Ithaca, N.Y. 14850

Filed Jun. 20, 1978, Ser. No. 917,347
Int. Cl.[2] G01N *15/08*
U.S. Cl. 73—38 20 Claims



1. A porosimeter comprising, in combination:

(a) an opaque, sample chamber constructed of metal for holding a sample of material whose porosity is to be measured;

(b) an opaque, non-horizontal tube constructed of metal having an upper end and a lower end, the lower end of said tube being connected to said chamber;

(c) means connected to said tube for filling said chamber and said tube with a liquid which is non-wettable with respect to said sample;

(d) means connected to said upper end of said tube for applying a fluid at various pressures to the upper end of said tube, said fluid having a lower density than said liquid;

(e) means for measuring the height of the upper of said liquid in said tube during application of said various pressures;

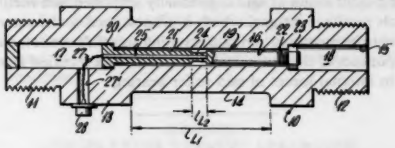
whereby the porosity of said sample in said chamber may be determined from the height measurements and the respective, various pressures.

4,203,318

STRAIN GAGE LOAD CELL

Alexander Yorgiadis, 12 Union Hill Rd., W. Conshohocken, Pa. 19428

Filed Aug. 16, 1978, Ser. No. 934,190
Int. Cl.[2] G01L *1/22*
U.S. Cl. 73—141 A 5 Claims



1. A strain gage load cell for sensing axial compression and elongation of load carrying members comprising a primary elongated load carrying member having a central axial opening extending lengthwise from at least one end thereof, said member having a portion of reduced section positioned between the ends thereof, said central opening extending beyond the ends of said portion of reduced section, a secondary load carrying member having a central section of slightly smaller diameter than said opening disposed within said opening and a length greater than the length of said portion of reduced section, said central section of said secondary member having a portion of reduced section with the length thereof being materially shorter than the length of the first said reduced section, the ends of said secondary member being fixedly secured to said primary load carrying member and at least one strain gage secured to a wall of the last said portion of reduced section whereby an amplified indication of axial strain is sensed by said strain gage with little if any error resulting from bending or torsional strains.

4,203,319

APPARATUS FOR MEASURING BEARING FORCES

Gerhard B. Lechler, Muehlenstrasse 58, 1000 Berlin 46, Fed. Rep. of Germany

Filed Oct. 11, 1978, Ser. No. 950,464
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1977, 2746937
Int. Cl.[2] G01L *5/12*
U.S. Cl. 73—141 A 11 Claims

1. An apparatus for measuring forces by means of at least one roller bearing having at least two rings, at least one of said rings being an inner ring and at least one of said rings being an outer ring, and at least a first and a second strain gauge mounted to said roller bearing at different points of said roller bearing to record the forces to be measured, first and second amplifiers electrically coupled to said first and second strain

gauges respectively for individually amplifying the resistance variations of said first and second strain gauges respectively, said apparatus characterized in that said roller bearing is preloaded and that the apparatus includes a first and a second rectifier electrically coupled to the outputs of said first and second amplifiers respectively so that the measured values from at least two measuring points on the roller bearing are individually rectified, and a subtractor electrically coupled to the outputs of said first and second rectifiers for subtracting the signals from said first and second rectifiers, wherein the results of said subtraction of said individually amplified and rectified signals results in a signal which is proportional to the external forces to be measured and said resulting signal does not include components of the individually amplified and rectified signals due to internal forces of said roller bearing.

4,203,320

TESTING APPARATUS FOR MULTIPLE COPY FORM SETS

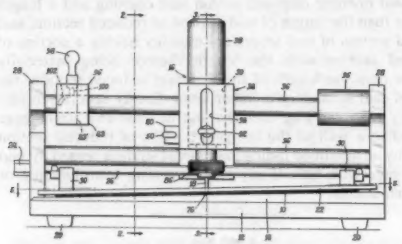
Alfred Walter, Schlieren, Switzerland, assignor to Alfred Walter AG, Schliern, Switzerland

Filed Apr. 23, 1979, Ser. No. 32,237

Claims priority, application Switzerland, May 3, 1978, 4852/78

Int. Cl.[2] G01M *19/00*; G01N *33/00*

U.S. Cl. 73—150 R **5 Claims**



1. A testing apparatus for multiple copy form sets comprising a supporting plate for supporting on its upper surface a form set to be tested, a carriage movably disposed above said supporting plate so as to be displaceable along a path of movement, said path of movement being inclined with respect to the surface of said supporting plate, a writing instrument carried by said carriage and including a writing implement movable perpendicularly to said surface, means for biasing said writing implement toward said surface so as to cause the writing implement to contact the form set, whereby movement of the carriage in the direction of reduced distance between said surface and said path of movement causes a line to be drawn upon the form set which is variable as a result of the reduced distance.

4,203,321

METHOD AND APPARATUS FOR TESTING HYDRAULIC AND PNEUMATIC SYSTEMS

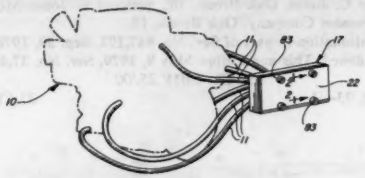
Gerrard N. Vyse, Bedford, and Horise M. Cooke, Weatherford, both of Tex., assignors to Stratoflex, Inc., Fort Worth, Tex.

Filed Jan. 16, 1978, Ser. No. 869,661

Int. Cl.[2] G01M *19/00*

U.S. Cl. 73—168 **11 Claims**

1. Apparatus for testing a plurality of pneumatic and/or hydraulic systems, comprising a length of hose connected in each of said systems, a valved fitting attached to each length of hose, each of said fittings including a normally closed valve, center member means attached to all of said fittings, a test fixture adapted to be connected to diagnostic test equipment for performing separate tests of said systems, said test fixture



being attachable to said center member means and including valve means for automatically opening said valved fittings.

4,203,322

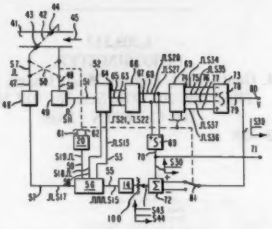
APPARATUS FOR THE ULTRASONIC MEASUREMENT OF THE FLOW VELOCITY OF FLUENT MEDIA

Alvin E. Brown, Claremont, and William E. Van Over, Monrovia, both of Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1977, Ser. No. 837,843

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **4 Claims**



1. Apparatus for measuring the flow rate of a fluid stream by repetitively transmitting and receiving ultrasonic signals upstream and downstream over preselected distances and a timing function generator having a frequency related output signal related to sound speed in said fluid stream for controlling the times at which ultrasonic signals are so transmitted, said apparatus comprising:

control means responsive to the upstream and downstream transit times over said preselected distances of said ultrasonic signals and to said generator for providing first and second control signals that are related, respectively, to the flow velocity of said stream and the speed of sound in said fluid stream, and

means including said generator responsive to said control signals for increasing the repetition rate at which said ultrasonic signals are transmitted and hence the apparent speed of sound in said fluid stream, whereby said control means associates each said received ultrasonic signal with a transmitted ultrasonic signal following that which actually initiated said received signal.

4,203,323

FLOWMETERING METHOD AND DEVICE

Olof L. Thorssell, Hallstahammar, Sweden, assignor to Bulten-Kanthal AB, Hallstahammar, Sweden

Filed Nov. 22, 1978, Ser. No. 962,889

Claims priority, application Sweden, Nov. 23, 1977, 7713241

Int. Cl.[2] G01F *3/00*

U.S. Cl. 73—194 E **4 Claims**

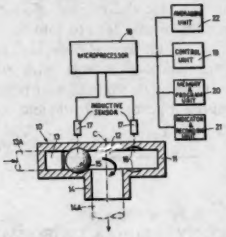
1. A method of volumetrically measuring a fluid stream in a conduit, which comprises

causing the fluid stream to move a follower element cyclically past at least one sensing point at a frequency proportional to the volume flow rate of the fluid stream,

producing passage signals in response to the follower element passing the sensing point,

detecting the passage signals, and

determining the total volume of the fluid that flows past a measuring point along the stream during a measuring period using the repetition rate of the detected passage signals as a parameter, wherein the improvement comprises



continually measuring the passage signal repetition rate throughout the measuring period,

determining from stored data representing the volume of fluid flowing past the measuring point per passage signal—said volume being herein termed the incremental volume—as a function of the repetition rate the incremental volume associated with each detected passage signal, and

summing the incremental volumes associated with the passage signals detected during the measuring period.

4,203,324

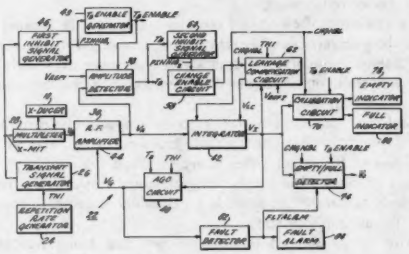
SONIC LIQUID LEVEL DETECTOR

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

Continuation-in-part of Ser. No. 822,199, Aug. 5, 1977, Pat. No. 4,144,517. This application Jan. 24, 1979, Ser. No. 6,183

Int. Cl.² G01F *23/00*

U.S. Cl. 73—290 V **33 Claims**



1. Apparatus for determining a fluid condition adjacent an inner wall boundary of a fluid container of the type which includes a wall having said inner and an outer wall boundary, said apparatus comprising:

(A) transducer means, including a sonic transducer, for:

(1) applying a sonic pulse to said outer wall boundary after said sonic transducer is placed in contact with said outer wall boundary such that said sonic pulse enters said wall and is reflected between said inner and outer wall boundaries, the magnitude of said sonic pulse decreasing each time it is reflected off of said inner wall boundary by an amount which varies as a function of said fluid condition adjacent said inner wall boundary;

(2) generating an electrical reflection pulse whose magnitude is representive of the instantaneous magnitude of said sonic pulse each time said sonic pulse is reflected off of said outer wall boundary whereby said transducer means generates a train of electrical reflection pulses responsive to each sonic pulse applied to said outer wall boundary;

(B) integration means for integrating said train of electrical reflection pulses during an integration period and for generating an integration output signal whose value varies as a function of said fluid condition; and

(C) output means for comparing said integration output signal to a predetermined value to determine said fluid condition.

4,203,325

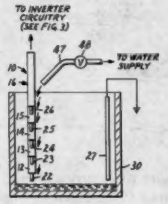
LIQUID LEVEL SENSING APPARATUS

Arthur L. Cowles, River Falls, and Thomas C. Ensign, Hudson Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 27, 1978, Ser. No. 890,672

Int. Cl.² G01F *23/26*

U.S. Cl. 73—304 R **11 Claims**



1. A liquid level multiple sensing electrode structure including a flat cable having a plurality of conductors terminated at various lengths at one end of said cable, said conductors having insulation extending the length of each conductor, except for a short terminating end portion of each conductor at said one end of said cable wherein each terminating end portion provides a sensing electrode and wherein the outer surface of said insulation is hydrophilic.

4,203,326

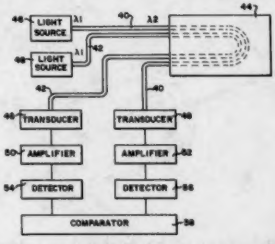
METHOD AND MEANS FOR IMPROVED OPTICAL TEMPERATURE SENSOR

Milton Gottlieb, and Gerald B. Brandt, both of Pittsburgh, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 26, 1979, Ser. No. 6,860

Int. Cl.² G01K *1/00*

U.S. Cl. 73—339 R **8 Claims**



5. An optical fiber temperature sensor for use in sensing an approximate temperature in an environment by detecting

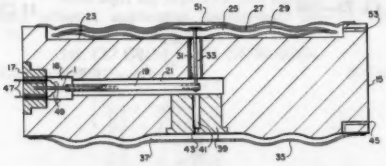
changes in attenuation of light comprising an optical fiber light conductor having a first end and a second end and including an optical fiber core, cladding material around said core, and a jacket surrounding said core and said cladding material, said core exhibiting an evanescent field which extends through said cladding material into said jacket at first selected range of optical wavelengths, said cladding material having a thickness whereby light attenuation in said conductor below a first temperature range is less than light attenuation in said conductor above said first temperature range, a light source for applying light at a first wavelength within said selected range of optical wavelengths to one end of said conductor, and detector means for detecting light at said first optical wavelength at the other end of said conductor.

4,203,327

PIEZORESISTIVE SILICON STRAIN SENSORS AND PRESSURE TRANSDUCERS INCORPORATING THEM

Gurnam Singh, Willow Grove, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1978, Ser. No. 920,538
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—721 **12 Claims**



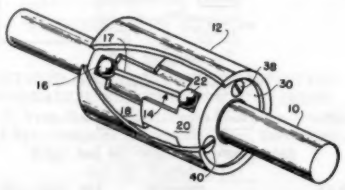
12. A pressure to electrical signal transducer including
a spinel beam having a pair of oppositely disposed faces and having an epitaxially grown layer of silicon in the form of a piezoresistive resistor on one of said faces,
support means attached to one end of said beam to cantilever said beam from said support means,
means responsive to fluid pressure connected to the other end of said beam to deflect said other end and to strain said beam and said resistor by an amount dependent upon said pressure, and
terminals electrically connected to said resistor, between which terminals the resistance is dependent upon the extent of said deflection and straining of said beam and said resistor.

4,203,328

ROTARY-TO-LINEAR-MOTION CONVERTER

William L. DeBoynton, South Pasadena, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 15, 1978, Ser. No. 942,570
Int. Cl.[2] F16H *21/16*
U.S. Cl. 74—25 **8 Claims**



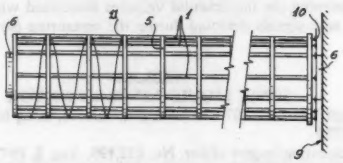
1. An adjustable pitch rotatable shaft-to-linear converter for imparting motion to a member having a cylinderical bore coaxial with a rotatable shaft and parallel with the direction of said motion, said converter comprising:
at least three drive rollers each having an enlarged end section of circular cross-section and each of said ends separated and connected to its opposite end by a connecting shaft, said rollers being equally spaced about the rotatable shaft and the cylindrical bore to the movable member;
first and second cages for encaging the first and second enlarged ends respectively of said drive rollers, each of said cages being mounted within said cylindrical bore and having a longitudinal aperture for the passage of said rotatable shaft, each of said cages having a plurality of equally spaced legs and having counterbored portions between said legs for the caging of said enlarged end sections, the ends of said legs of said first cage abutting ends of the legs of said second cage, said first and second cages being rotatably adjustable with respect to each other to adjust the pitch angle of said rollers; and
means for clamping together said first and second cages.

4,203,329

DEVICE FOR CONVERTING A UNIFORM CIRCULAR MOVEMENT INTO A VARIABLE OR UNIFORM LONGITUDINAL MOVEMENT

Manuel A. Lopez, Madrid, Spain, assignor to Technoresinas Espanola, S.A., Madrid, Spain

Filed Aug. 8, 1977, Ser. No. 822,713
Claims priority, application Spain, May 4, 1977, 458.456
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.2 **3 Claims**

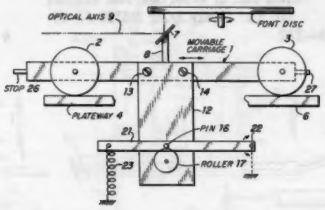


1. A device for converting a uniform circular movement selectively into a variable or a uniform longitudinal movement, said device comprising:
an assembly of elongated circular rods spatially located at the generatrices of a right cylinder, said rods being capable or respective rotation about their own axes with all said rods rotating about their own axes at a constant angular speed,
each rod having circular grooves respectively provided around its periphery, said grooves being selectively spaced from each other along each rod,
said grooves on said rods being arranged respectively from one to another to provide a helicoidal alignment around the assembly of rods,
wire means housed in said grooves and being helically wound about said assembly or rods in said helicoidal alignment of said grooves,
whereby the rotating of said rods about their own axes generates a longitudinal movement of said wire means, said longitudinal movement being uniform when portions of said rods have the grooves equidistantly spaced from each other, and said longitudinal movement being variable when the distance between the grooves varies in accordance with differential elements such that a longitudinal movement is obtained whose velocities with respect to time vary from zero to a maximum and then back to zero so that a distribution of speeds is achieved which responds to a preestablished law of velocities.

4,203,330
PHOTOTYPESETTER CARRIAGE DETENT MECHANISM

Peter R. Ebner, South Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Dec. 27, 1977, Ser. No. 864,307
Int. Cl.[2] G05G 5/06
U.S. Cl. 74—527 11 Claims

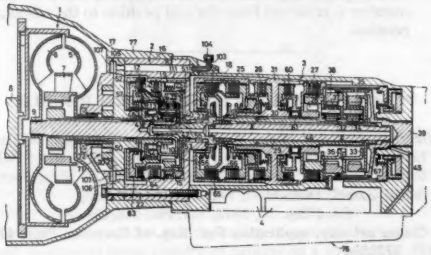


1. In a phototypesetter having a machine frame:
a. an elongated way member;
b. a moveable carriage having a carriage support means for supporting said moveable carriage with respect to said way member and for facilitating a lateral shift of said moveable carriage between a first carriage position and a second carriage position;
c. first detent member support means coupled to said moveable carriage for supporting a first detent member thereon;
d. a second detent member coupled to said machine frame for coacting with said first detent member; and
e. spring means for mechanically biasing said first and second detent members against each other and simultaneously mechanically biasing said carriage support means against said way member.

4,203,331
AUTOMATIC TRANSMISSION WITH OVERDRIVE

Yoshio Shindo, Aichi, and Hiroshi Ito, Ima, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichiken, Japan

Filed Sep. 28, 1977, Ser. No. 837,192
Claims priority, application Japan, Apr. 27, 1977, 52-47876
Int. Cl.[2] F16H 57/02, 37/00
U.S. Cl. 74—606 R 4 Claims



1. An automatic transmission comprising: a fluid torque converter; an overdrive gear mechanism having an input side operably connected to said torque converter; an oil pump having a pump chamber defined by an oil pump body and an oil pump cover and generating a hydraulic pressure; an underdrive gear mechanism operably coupled to an output side of said overdrive gear mechanism, said overdrive gear mechanism thus being located between said torque converter and said underdrive gear mechanism; an overdrive case encompassing said overdrive gear mechanism in cooperation with said oil pump cover; a transmission case extending to encompass the sides of said underdrive gear mechanism in cooperation with said overdrive case; a breather port in communication with the outside atmosphere; oil supply means located generally beneath said underdrive gear mechanism; oil supply passage means defining an oil supply and return system through said automatic transmission between said oil supply means and said oil pump for delivering oil to the operative elements of said automatic transmission; means defining through said overdrive case a plurality of oil supply and return passages formed as part of said oil supply and return system, said passages extending generally axially through said case and being generally located toward the outer circumferential regions thereof; a breather passage extending axially through said overdrive case in communication between said breather port and said oil pump; and a plurality of radially extending communicating holes arranged in flow communication between selected ones of said plurality of oil supply and return passages defined through said overdrive case to eliminate in said automatic transmission the need for further breather passages in said automatic transmission.

4,203,332
ADJUSTING TOOL FOR AIR DELIVERY REGISTER

Sheryll L. Corsetti, P.O. Box 473, Delray Beach, Fla. 33444

Filed Aug. 28, 1978, Ser. No. 937,144
Int. Cl.[2] B25B 9/00; A47F 13/06
U.S. Cl. 81—3 R 4 Claims

2. A tool for adjusting external and internal dampers in a register used in an air delivery system, comprising:
a handle means to reach registers at a distance,
an adjusting means attached to an end of said handle means including a base for attaching said adjusting means to said handle means
a body attached to said base, said body having a front gripping portion and a rear gripping portion, said portions in generally flat parallel spaced relationship to adjust said external dampers,
each said portion having a longitudinal slot separating each said portion into two members, said longitudinal slots being in parallel alignment with each other allowing adjustment of said internal dampers,
each said member having a distal transverse edge with a shallow indent to grip external dampers and prevent slippage and an outward longitudinal edge having a plurality of angular indents to adjust said external dampers, said longitudinal edge and said distal transverse edge forming outwardly extending arms for initial opening of said dampers.

4,203,333

COAXIAL CABLE STRIPPING DEVICE

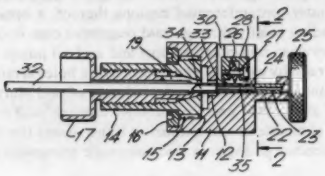
Luigi Campari, Turin, Italy, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 812,926, Jul. 5, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,446

Claims priority, application United Kingdom, Jul. 2, 1976, 27556/76

Int. Cl.[2] H02G 1/12

U.S. Cl. 81—9.5 A 3 Claims



1. A device for stripping insulation from between inner and outer conductors of coaxial cables, comprising, means having an axial channel of constant arcuate cross-section, open at both ends with one end adapted to receive and rigidly support a coaxial cable and the other end adapted to rotatably receive a tubular bit mounted concentrically with the channel axis and spaced inwardly from the channel wall, said bit having at one end a bore of substantially equal cross-sectional size to the conductor of a coaxial cable which may be inserted in said channel, and a helical thread of substantially equal height to the insulation thickness between the inner and outer conductors of said coaxial cable, said bit being mounted in generally exact alignment with the coaxial cable for non-gyrotory rotary and reciprocal rectilinear movement relative to the axis of the end portion to bore out the insulation between the inner and outer conductors without substantial deformation of the conductors.

4,203,334

PROCESS AND APPARATUS FOR CUTTING SHEETS INTO INDIVIDUAL SHEETS AND SUBSEQUENT ORDERLY STACKING OF THE INDIVIDUAL SHEETS

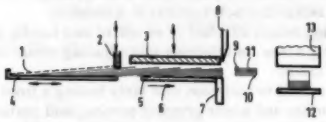
Franz Zettler, Alpenstrasse 5, 8930 Schwabmuenchen, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,481

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2731023

Int. Cl.[2] B65H 5/24

U.S. Cl. 83—23 14 Claims



1. A process for cutting sheets each into a plurality of sheets and thereby forming an orderly stack of said cut individual sheets, comprising:

partially overlapping sheets to be cut and conveying the partially overlapped sheets by a conveyor means towards a cutting means;

cutting the partially overlapped sheets where they overlap, after conveying same through the cutting means by the width of a said individual sheet to separate a stack of individual sheets from the partially overlapping sheets; and

adding further sheets to partially overlap those on said conveyor means as successive stacks of individual sheets are cut off.

4,203,335

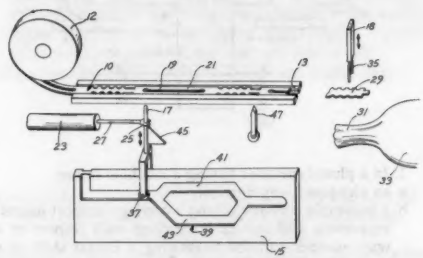
DEVICE TO FEED A RIBBON OF SAUSAGE SUPPORT LOOPS INTO CLIP ATTACHMENT APPARATUS

Rufus G. Coffey, Hazelwood, N.C., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,251

Int. Cl.[2] B26D 5/20; B65H 17/40

U.S. Cl. 83—232 6 Claims



1. A device for feeding a continuous ribbon of individual sausage loops to a clip attachment apparatus, comprising, in combination:

a body member, said body member including a guide track for the ribbon;

a movable ribbon guide pin member mounted in the body member;

a follower connected to the guide pin member;

a cam track defined in the body member, said track having a run for movement of the pin from a null position to a ribbon engagement and subsequent advance position and a separate connected run for ribbon disengagement and pin member movement from the advance to the null position; and

reciprocating drive means for incrementally driving the pin member follower and engaged ribbon in run of the cam track between the null position and the advance position for advancing the ribbon into the clip attachment apparatus and for driving the follower in the connected run for disengaging the pin member from a ribbon when the pin member is retracted from the null position to the advance position.

4,203,336

PUNCH CHANGE MECHANISM FOR A DOUBLE PRESSURE PIN PRESS

Friedrich Boettger, Haan; Walter Eugster, Ratingen; Walter Lenssen, and Bodo Missmahl, both of Dusseldorf, all of Fed. Rep. of Germany, assignors to Malmadie & Co. Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,183

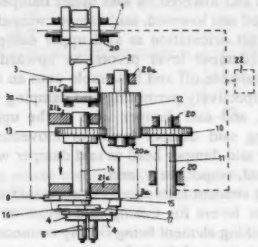
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750536

Int. Cl.[2] B26F 1/02

U.S. Cl. 83—550 8 Claims

1. In a double pressure press having a pressure carriage supported by and reciprocable with respect to fixed structure, a punch holder plate on the carriage carrying two punches, the punch holder plate being cyclically movable in a plane at a substantial angle with respect to the direction of reciprocation of the carriage, and means for driving the carriage and the punch holder plate and for maintaining them in synchronism, the improved means for driving the carriage and the punch holder plate and for maintaining them in synchronism which comprises a drive train including a first spur gear rotatably

mounted on the fixed structure with its longitudinal axis parallel to the direction of reciprocation of the carriage, a second spur gear rotatably mounted on the carriage for reciprocation therewith with respect to the first spur gear, the second spur gear having its axis parallel to the direction of reciprocation of



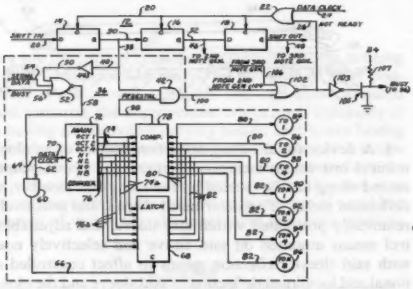
the carriage, the teeth of one of the first and second spur gears over its entire axial length being constantly in mesh with the teeth of the other spur gear, and the means for driving the carriage and the punch holder plate and for maintaining them in synchronism includes means drivingly connecting the second spur gear with the punch plate holder.

4,203,337

LARGE SCALE INTEGRATED CIRCUIT CHIP FOR AN ELECTRONIC ORGAN

Harold O. Schwartz, Elburn, and Dennis E. Kidd, Sycamore, both of Ill., assignors to The Wurlitzer Company, DeKalb, Ill.

Filed Jun. 20, 1978, Ser. No. 917,313
Int. Cl.[2] G10H *1/06, 5/06, 5/10*
U.S. Cl. 84—1.01 **12 Claims**



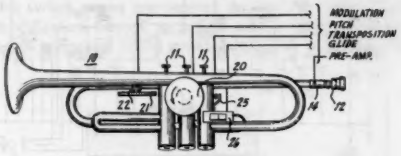
1. A large scale integrated circuit chip for use in an electronic organ or the like having a keyboard including a plurality of keys and a plurality of key switches respectively controlled by said keys, comprising a plurality of frequency generating means responsive to the actuation of said keyswitches for generating frequencies corresponding to musical tones, each of said generators being capable of generating a frequency corresponding to any note of said electronic organ or the like, means interconnecting said frequency generators with said keyswitches for selectively causing said generators to generate frequencies corresponding to musical tones, a plurality of groups of keying means connected to said frequency generators for keying frequencies out of said chip, separately controllable attack and decay controlling means for each group of said keying means, and said attack and decay controlling means being further responsive to each frequency generator means independently of the other said keying means within each group thereof.

4,203,338

TRUMPET AND SYNTHESIZER APPARATUS CAPABLE OF POLYPHONIC OPERATION

Pat Vidas, 3778 Dunhill Rd., Wantagh, N.Y. 11793

Filed Jun. 4, 1979, Ser. No. 45,594
Int. Cl.[2] G10H *3/02*
U.S. Cl. 84—1.14 **10 Claims**



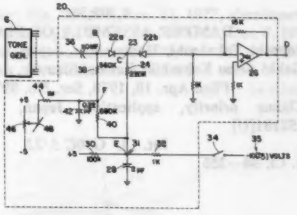
1. A combination adapted for use with a valve controlled brass instrument of the wind type and a synthesizer module associated therewith, with said instrument providing said synthesizer control signals for operating the same, with a first potentiometer mounted on said instrument and controllable in resistance by means of a first rotatable wheel coupled to said potentiometer for providing a variable resistance change manifesting a pitch control signal for said synthesizer, a second potentiometer mounted on said instrument with a second wheel coupled to said second potentiometer, with said second wheel positioned transverse to said first wheel for varying the resistance of said second potentiometer manifesting a modulation control signal for said synthesizer.

4,203,339

BRASS KEYER SYSTEM FOR ELECTRONIC ORGAN

Alan B. Welsh, and John W. Robinson, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Apr. 6, 1978, Ser. No. 893,872
Int. Cl.[2] G10H *1/02, 5/10*
U.S. Cl. 84—1.19 **23 Claims**



1. A brass keyer system for an electronic musical instrument comprising:

an output,

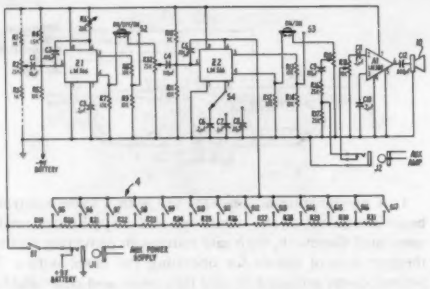
tone generator means for supplying a square wave signal to said output, and

control means interposed between said tone generator means and said output for controlling the amplitude and duty cycle of the square wave signal supplied to said output such that the amplitude increases to a substantially final value and the duty cycle decreases to a substantially final value over a period of time with the decrease in duty cycle lagging the increase in amplitude so that the final value of the duty cycle is reached some time after the final value of the amplitude is reached.

4,203,340
ELECTRONIC MUSICAL INSTRUMENT

David E. Ostrom, Walnut Creek, Calif., assignor to O/R Inc., Walnut Creek, Calif.

Filed Jan. 26, 1979, Ser. No. 6,726
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.26 6 Claims



1. An electronic instrument for producing musical tones comprising

tone effect control means selectively controllable by an operator of the instrument to provide an alternating current output signal having selectably differing waveform characteristics and selectively varying rise and decay times and selectively varying amplitude and frequency;

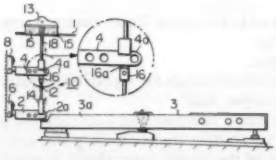
manually operable tone frequency control means having both a selectively variable electrical resistance characteristic and a selectively variable capacitance characteristic, one of said characteristics being variable among logarithmically spaced increments and the other said characteristic being variable among linearly spaced increments; and

tone signal generating means operatively connected both to the output of said tone effect control means and to said tone frequency control means for generating an output tone signal having a frequency proportional to both the selected resistance and the selected capacitance of said tone frequency control means and having a waveform corresponding at least partially to said tone effect control means output signal.

4,203,341
DAMPER ASSEMBLY OF PIANOS

Hiroyoshi Takahashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Sizuoka, Japan

Filed Apr. 18, 1978, Ser. No. 897,404
Claims priority, application Japan, Apr. 26, 1977, 52/52181[U]
Int. Cl.[2] G10C *3/22*
U.S. Cl. 84—255 3 Claims



1. An improved damper assembly of pianos comprising:

a lower lever having one end pivoted to a fixed support and having a free end operationally related to the rear end portion of an associated key, such that motion of the key causes the rear end portion thereof to pivot said lower lever; an upper damper lever having a respective one end pivoted to a fixed support and being spaced from and arranged over said lower damper lever;

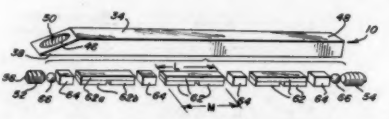
a motion transmitting damper wire carried at the bottom end thereof by the free end of said upper damper lever, said damper wire being relatively short and fixedly connected with said upper damper lever so that said damper wire is raised and lowered by said upper damper lever; and as it is raised and lowered, said damper wire also maintains the same tilt orientation as said upper damper lever as said upper damper lever pivots, an upwardly held damper head raisable off and lowerable onto an associated string for respectively permitting and damping vibration of that string, and said damper wire at the upper end thereof holding said damper head for movement to raise and lower said damper head as said damper wire is raised and lowered, respectively, and

a linking element interposed between said upper and lower damper levers for linking said levers to pivot together, said linking element being fixedly connected to said lower lever at one end thereof and having a rounded cap at the other end thereof, the free end of said upper damper lever resting on and supported by said rounded cap, whereby said linking element does not move rigidly with the said upper damper lever with respect to which said linking element is pivotable.

4,203,342
DEVICE FOR AFFECTING DEFLECTION CONTROL OF AN ELONGATED MUSICAL INSTRUMENT SHAFT

John R. Montgomery, 1020 Spruce St., Winnetka, Ill. 60093, and James S. Richards, 945 E. Kenilworth, #330, Palatine, Ill. 60067

Filed Sep. 25, 1978, Ser. No. 945,306
Int. Cl.[2] G10D *3/00*
U.S. Cl. 84—293 16 Claims



1. A device for affecting deflection control of an elongated musical instrument member, comprising a sleeve adapted to extend along and be carried by the elongated member, sleeve deflection means of predetermined shaped, and selectively and removably positioned within said sleeve, and adjustable control means mounted on said sleeve and selectively coacting with said sleeve deflection means to affect controlled directional and locational deflection of said sleeve and the elongated member carrying said sleeve.

4,203,343
SNARE DRUM CONTROL MECHANISM

Harry Bargeman, 56 Park Gardens, Hawkwell, nr. Hockley, Essex, England

Filed Nov. 3, 1978, Ser. No. 957,208
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—415 7 Claims

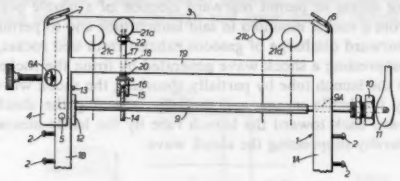
1. A drum snare control mechanism comprising

a frame for location within the shell of a snare drum,

a snare mounted under tension on said frame,

snare-support means on said frame movable into and out of a position in which they engage the snare at two spaced apart positions thereon leaving the length of snare therebetween free to vibrate, and tone-varying means operable at will to change the distance between said positions thereby to change the tone of the drum by a desired amount, said snare-support means comprising a first pair

of snare-support members spaced apart by a first distance and a second pair of snare-support members spaced apart by a second distance within said first distance, and said



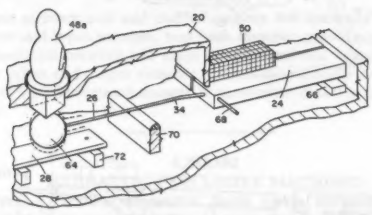
tone-varying means comprising a mechanism operable to move the first and second pairs of members alternately into engagement with the snare.

4,203,344

MUSICAL EDUCATION TOY

Teresa A. Krosnick, 1645 B Waverly Way, Baltimore, Md. 21239

Filed Mar. 9, 1979, Ser. No. 19,238
Int. Cl.[2] G09B *15/04*
U.S. Cl. 84—470 R **13 Claims**



1. In a toy for musical education comprising means defining respectively corresponding pluralities of: notes in scale positions, keys in a keyboard, hammers, and tone bars associated with said hammers, the improvement comprising: a plurality of tokens having respective identifying means, each token having correspondence to a respective one of said notes, first means for sounding each tone bar by dropping a respective token at a scale position thereabove; and means for associating said tone bar, token identity and scale position with position of a said key independent of visible key alignment with said scale position.

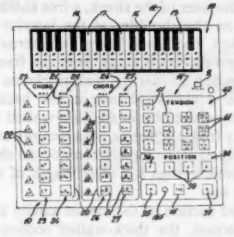
4,203,345

AUTOMATIC VISUAL TEACHING DEVICE FOR THE LEARNING OF MUSIC OR COMPONENT PARTS THEREOF

Maurice Collin, 620 Rue Robichaud Charlesbourg; Michel Lapointe, 1672 Ave. Colmar Orsainville, and André Collin, 1525 Leduc Bourg Royal, all of Quebec City, Quebec, Canada

Filed Jan. 24, 1978, Ser. No. 871,973
Claims priority, application Canada, Nov. 15, 1977, 290883
Int. Cl.[2] G09B *15/02*
U.S. Cl. 84—478 **16 Claims**

1. An automatic visual music teaching device for displaying the exact structure of coded musical chords or scales snd permitting finger placement on a visual keyboard, said device comprising a first group of actuable switches for selecting a desired major and minor coded chord to be visually displayed, circuit means associated with said switches for providing binary signals indicative of said desired coded chord or scale, a decoding circuit for decoding said signals and providing a coded message signal, said coded message signal constituting an output address line signal which activates predetermined memory circuits of a memory system, said memory circuits feeding coded signals to matrix decoders to select proper x-y lines in said matrix, and display means having a plurality of light sources each associated with an intersecting x-y line of said matrix to visually indicate a composite part associated with one of said actuable switches representative of said desired coded chord, said display means further having a keyboard having visual coded markings thereon corresponding to the structure of all coded markings on particular ones of said actuable switch means representing the selected coded chord and modification thereof, each light source being associated with each said visual coded markings whereby to indicate the



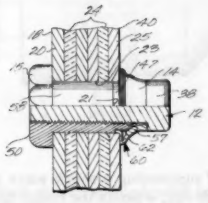
position of said composite parts of said coded chord in association with said keyboard; a second group of actuable switches representative of individual tensions of a selected chord of said first group of switches for altering, by augmenting or diminishing the said selected chord, the structure of said selected chord to display a modified selected chord; a third group of switches representative of the fundamental and three inversions of said selected chord to select the position of said selected chord on the keyboard and while maintaining the structure of said selected chord, said second and third group of switches also having circuit means to provide coded message signals to said memory circuit.

4,203,346

BLIND BOLT FASTENER FOR LOW BEARING STRENGTH MATERIALS

David E. Hall, Costa Mesa, and Edgar L. Stencel, Huntington Beach, both of Calif., assignors to VSI Corporation, Pasadena, Calif.

Continuation of Ser. No. 806,302, Jun. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 730,738, Oct. 8, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,008
Int. Cl.[2] F16B *13/06, 13/10*
U.S. Cl. 85—70 **14 Claims**



1. An improvement in a blind fastener of the type having a nut with a manufactured head to abut a setting side of a pair of sheets, a shank of the nut integral with and axially adjacent the manufactured head, the shank being for receipt in aligned holes in the sheets, an internally threaded bore of the nut, and a nose of the nut integral with the shank and on an end of the nut opposite the manufactured head, a sleeve for developing a blind side bulb against a backside of the sheets and to cooperate with the manufactured head in holding the sheets together, the

sleeve having an axial bore and a limited outside diameter for passing through the aligned holes, a threaded core bolt for receipt in the bore of the sleeve and having a head for compressive engagement with an end of the sleeve opposite the nose of the nut, the core bolt head having a diameter for passing through the aligned holes, the improvement comprising:

(a) a relieved section of the nose of the nut extending axially from the nose end of the nut to a radial shoulder at an interior end of the relieved section, the relieved section having a diameter less than the diameter of the shank;

(b) a thin-walled and tapered section of the sleeve having an internal diameter for receipt on the relieved section of the nut, an outside diameter that is substantially constant and equal to the diameter of the shank, a free end for compressive bearing on the shoulder at the interior end of the relieved section, the taper being an internal taper and converging in a direction away from the free end of the thin-walled section so that the wall thickness of the thin-walled section is always thinner at the backside of the sheets than anywhere else in the thin-walled section in a direction away from the sheets, a maximum outside diameter substantially equal to the diameter of the shank, and an axial length greater than the axial length of the relieved section of the nut;

(c) a thick-walled section of the sleeve axially adjacent the thin-walled section, the thick-walled section having an internal diameter less than the internal diameter of the thin-walled section, and an outside diameter substantially equal to the outside diameter of the thin-walled section, the thick-walled section having the end of the sleeve which compressively bears with the head of the core bolt; and

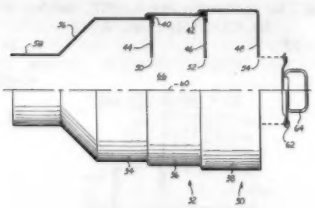
(d) the thin-walled section being capable of receipt in the hole in the backside sheet and in extending from such sheet, and of collapsing to form a bulb at the backside sheet in response to being compressed between the head of the core bolt and the shoulder of the nut upon the tightening of the core bolt in the nut to draw the head of the core bolt towards the shoulder of the nut.

4,203,347

SHOCK SUPPRESSING APPARATUS AND METHOD FOR A ROCKET LAUNCHER

George T. Pinson, and Alex B. Hunter, both of Huntsville, Ala., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 10, 1978, Ser. No. 895,247
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.816 **39 Claims**



1. A method of suppressing a shock wave generated by a rocket launching device, wherein the rocket launching device comprises an elongate launch tube having a longitudinal axis, a forward end from which a rocket is fired, and a rear exhaust end through which exhaust gases exit during firing of the rocket, said exhaust end having a predetermined cross-sectional area and diameter, said method comprising:

a. providing a substantially enclosed expansion chamber having a diameter and cross-sectional area substantially greater than the diameter and cross-sectional area of the exhaust end of the launch tube,

b. providing annular baffle means extending in said chamber radially inwardly toward the longitudinal axis of the launch tube,

c. providing in said baffle means longitudinally aligned opening means to permit rearward ejection of a nozzle plug from a rocket mounted in said launch tube and to permit rearward discharge of gaseous exhaust from said rocket,

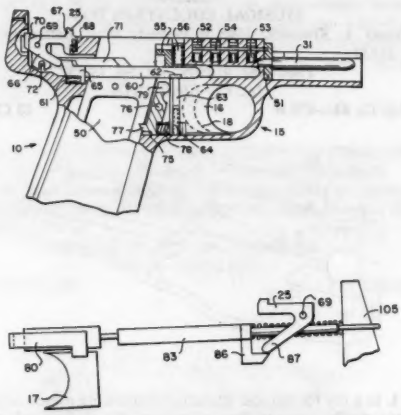
d. suppressing a shock wave generated by firing the rocket in the launch tube by partially absorbing the shock wave by the baffle means, and partially reflecting the shock wave back toward the launch tube by the baffle means, thereby suppressing the shock wave.

4,203,348

FIREARM APPARATUS

Paul J. Sokolovsky, 641 Torrington Dr., Sunnyvale, Calif. 94087

Filed Dec. 9, 1977, Ser. No. 859,047
Int. Cl.[2] F41C *17/08*
U.S. Cl. 89—148 **18 Claims**



1. In a firearm having a firing mechanism, a safety mechanism comprising: a self-retracting safety trigger member and a movable safety assembly having a safety-on and a safety-off position responsive to successive finger pullings of the safety trigger member, a first of such pullings inhibiting and a second of such pullings enabling the operation of said firing mechanism in the firearm.

4,203,349

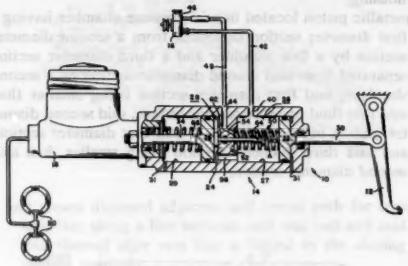
BRAKE BOOSTER

Earl A. Sheridan, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 3, 1978, Ser. No. 892,574
Int. Cl.[2] F15B *13/02*; B60J *13/12*
U.S. Cl. 91—47 **2 Claims**

1. In a brake booster, the combination of a housing having an inlet and a return, said housing having a pair of bores leading to an inner wall, an input member movably disposed within one of said bores, an output member movably disposed within said other bore and cooperating with said inner wall to define a pressure chamber, said inlet and said return opening into said one bore to provide fluid pressure within said one bore, said inner wall including a passage communicating said one bore with said pressure chamber to communicate fluid pressure from said one bore to said pressure chamber, a resilient member extending between said inner wall and said input member and defining a central space, said return being substantially disposed within said inner wall and opening into said central space, said input member being movable toward said inner wall

to contract said resilient member to restrict communication from said inlet to said return via said central space in order to increase the fluid pressure in said one bore and said pressure chamber, and a push member disposed within said central space and extending through said inner wall to oppose said



input member and said output member but normally spaced from said input member, said push member providing a rigid connection between said input member and said output member when said output member remains substantially stationary after a predetermined amount of movement of said input member.

4,203,350

HYDRAULIC PERCUSSIVE MACHINES

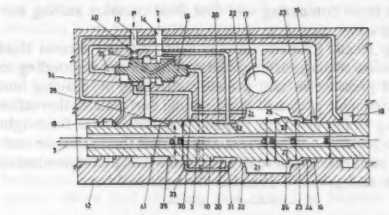
Trevor E. Wallace, Bryanston, South Africa, assignor to The Steel Engineering Company Limited, Roodepoort, South Africa

Filed Feb. 28, 1978, Ser. No. 882,218

Claims priority, application South Africa, Mar. 7, 1977, 77/1338

Int. Cl.[2] F01B *7/18, 11/02;* F01L *25/06*

U.S. Cl. 91—235 **5 Claims**



1. A hydraulic percussive machine comprising: a piston, a cylinder in which the piston is caused to reciprocate, a cushioning flange on the forward end of the piston, a cavity in the cylinder in which the cushioning flange normally moves, a dashpot at the forward end of the cavity into which the cushioning flange can move on overtravel of the piston during the power stroke of the piston to trap fluid in the dashpot, a rear space in the rear of the cylinder, a shoulder on the backward end of the piston operating in the rear space, a control valve for admitting pressure fluid to the rear space on the working stroke and exhausting pressure fluid from the rear space on the return stroke, an inlet to the dashpot at its forward end, means to supply pressure fluid to said inlet from a source outside said cylinder whereby the last-named fluid first enters the dashpot and then proceeds to said cavity, and an outlet from the cavity leading to the control valve so that when that valve admits fluid to the rear space fluid from the cavity flows into the rear space.

4,203,351

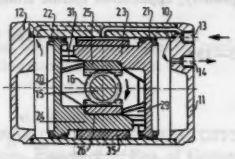
FLUID MOTOR ACTUATOR FOR ROTATING A SHAFT BACK AND FORTH

Heinz G. Schwind, Hengelo, Netherlands, assignor to Griesel B.V., Hengelo, Netherlands

Filed Feb. 14, 1978, Ser. No. 877,717

Int. Cl.[2] F01B *7/02*

U.S. Cl. 92—69 R **6 Claims**



1. A fluid motor actuator for rotating a shaft back and forth, comprising a cylinder in which two pistons provided with extensions facing one another and carrying racks are movable towards and away from one another, said racks facing one another and engaging a common spur gear on a transverse shaft projecting from the cylinder, said pistons each being provided with at least two auxiliary extensions, describing together with the former extensions carrying the racks one common cylindrical outer surface, and said extensions and auxiliary extensions of one piston and those of the other piston are alternating.

4,203,352

PISTON FOR MULTI-STAGE OPERATION

Waldemar Schuster, Grossglocknerstr. 2d, D-8135 Söcking-Gartenstadt, and Max G. Hohn, Prinzenweg 5, D-8130 Starnberg, both of Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,501

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2631013

Int. Cl.[2] F01B *19/00*

U.S. Cl. 92—94 **8 Claims**

1. In a combined air and spring-loaded brake cylinder, the combination of a plunger, a piston having a peripheral portion surrounding a body portion of a resilient material, one side of said body portion being acted upon by one of said plunger and air pressure, a diaphragm between said piston and said plunger, said piston body portion having a central portion which is capable of elastic deformation when subjected to a force exceeding a predetermined level, a pressure plate contacting the other side of said piston, spring means for urging said pressure plate in contact with said piston, and a piston rod to be coupled to a brake operating mechanism and connected to said

pressure plate, said piston movable as a unit along a predetermined distance when acted upon by one of said plunger and air pressure to permit additional travel of the plunger upon deformation of said body portion.

4,203,353

PISTON MEANS FOR PISTON-CYLINDER ARRANGEMENTS

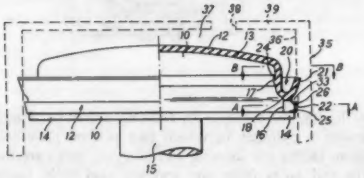
Jack Burnham, Melksham, and Jack Washbourn, London, both of England, assignors to Avon Industrial Polymers Limited, Melksham and Westinghouse Brake & Signal Co. Ltd., London, both of, England

Filed Sep. 19, 1977, Ser. No. 834,441

Claims priority, application United Kingdom, Sep. 24, 1976, 39681/76

Int. Cl.[2] F01B *31/10*; F16J *9/08*

U.S. Cl. 92—159 **7 Claims**



1. A piston-cylinder arrangement comprising a cylinder member and piston means mounted slideably therein, the piston means comprising a piston member and a packing member including first and second axially spaced radially outer surfaces dimensioned such that each contacts slidingly against the wall of said cylinder, the piston means comprising a lubricant reservoir in communication with the space between said surfaces, said space being substantially closed by said cylinder wall and the packing member further comprising a ring portion the radially outer surface of which constitutes said second outer surface and which has a diameter greater than the maximum diameter of the piston member to prevent "hammering" of the piston means in the cylinder member, and further comprising a lip portion having a radially outer surface constituting said first outer surface, the lip portion and ring portion being formed as a unit integral with one another in axially spaced relation such that the radially outer surface of the lip portion cooperates with an opposed space defining surface of said ring portion to define said space, the space defining surface of the ring portion and the radially outer surface of the ring portion forming an acute angle and a single scraper ring for lubricant recovery being formed on the outermost edge of the space defining surface of the ring portion, said lip portion extending in a direction away from said scraper ring.

4,203,354

HYDRAULIC PISTON WITH METALLIC O-RING GROOVE AND NON-METALLIC SLIDABLE SURFACES

Joseph A. Cunningham, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 752,366, Dec. 20, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,305

Int. Cl.[2] F16J *1/00, 9/08, 11/04*

U.S. Cl. 92—169 **2 Claims**

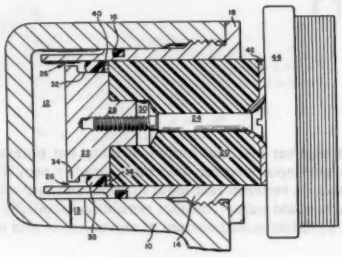
1. A fluid pressure actuated piston assembly comprising:

a housing having a cavity therein, said cavity having at least one closed end;

a metallic cylindrical member fixed to said housing and extending into said cavity, said cylindrical member having a bore therein connected to said cavity, said bore defining a first fluid pressure sealing surface;

a non-metallic piston located in said bore and cooperating with said housing to define a pressure chamber in said cavity, said non-metallic piston having a peripheral surface directly engaging said first fluid pressure sealing surface in said metallic cylindrical member, said peripheral surface being non-metallic attenuating wear of said metallic first fluid pressure sealing surface, said non-metallic piston having a first face with a hole therein and located in said bore and a second face located outside said housing;

a metallic piston located in said pressure chamber having a first diameter section separated from a second diameter section by a first shoulder and a third diameter section separated from said second diameter section by a second shoulder, said first diameter section being smaller than said first fluid pressure sealing surface, said second diameter section being smaller than said first diameter section, and said third diameter section being smaller than said second diameter section;



fastener means for holding said second diameter section of said metallic piston against said first face of said non-metallic piston to establish a second sealing surface on said second diameter section and a third sealing surface on said first face, said third diameter section being positioned in said hole in engagement with the walls thereof, said fastener means, said third diameter section and said non-metallic piston cooperating to hold said first diameter section concentric to said bore to prevent the first diameter section from contacting said first fluid pressure sealing surface; and

sealing means located between said first and second fluid pressure sealing surface, said sealing means responding to fluid pressure in said pressure chamber by moving into engagement with said third sealing surface and thereafter being compressed to radially expand into a fluid-tight engagement with said first and second fluid pressure sealing surfaces to prevent fluid from being communicated from said pressure chamber through said bore.

4,203,355

PACKAGING STRUCTURE AND APPARATUS USEFUL IN ITS ASSEMBLY

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 7, 1978, Ser. No. 884,193

Int. Cl.[2] B31B *1/22*

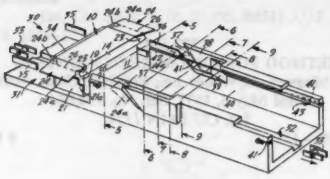
U.S. Cl. 93—58 R **7 Claims**

1. Apparatus for use in the assembly of a partially erected carton of the type having at least one flap having one end hingedly attached to said carton and an opposite free end, said flap being adapted for intimate contact with portions of one wall of said carton for closing and sealing the same, said apparatus comprising:

means for moving said carton along a travel path, with said flap extending in a direction transverse to the travel path;

means adjacent said travel path for folding said flap against the main body of said carton as it is moved along said travel path;

means for forcing said flap into intimate contact with said wall portions, for bonding thereto, after said flap is folded against said wall portions;



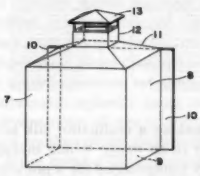
and means disposed adjacent said travel path for severing said flap along a line between said one end and said free end thereof after said flap is folded to the closing and sealing position.

4,203,356

BAFFLE FOR GAS HEATER VENTS

Lawrence J. Pieschke, Box 171, Woodslee, Ontario, Canada (N0R 1V0)

Filed Nov. 30, 1978, Ser. No. 965,080
Int. Cl.² F23L *17/02*
U.S. Cl. 98—66 R **1 Claim**



1. A baffle for enclosing the part of the vent of a gas heater which is located on the outside of a wall of a building containing the gas heater, said baffle comprising a sheet metal enclosure having a front rectangular wall, a side rectangular wall extending from each vertical edge of said front wall and bent at right angles thereto, an upper trapezoidal cover extending from the top edge of said front wall toward the building, second and third upper trapezoidal covers extending from the top edges of said side wall toward the other side wall, and a fourth upper cover extending from the rear wall of the building toward said front rectangular wall, the upper edges of said four upper covers terminating in a short chimney of rectangular horizontal cross section, a cover of generally pyramidal shape spaced above said chimney and extending beyond the four sides thereof, and means spacing said cover above said chimney to enable the escape of combustion gases but to prevent rain and snow from entering the chimney.

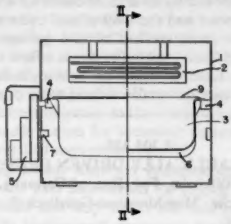
4,203,357

OSCILLATING COOKING APPARATUS

Marcel Vaussanvin, Tournus, France, assignor to Manufacture Metallurgique de Tournus, Tournus, France

Filed May 17, 1979, Ser. No. 39,947
Claims priority, application France, Jan. 9, 1979, 79 01165
Int. Cl.² A47J *37/04, 37/12*
U.S. Cl. 99—340 **9 Claims**

1. An oscillating cooking apparatus comprising, a fixed frame, a heat source mounted adjacent the top of said frame, an open-topped receptacle for holding food to be cooked, means on said frame mounting said receptacle for free rotation about its longitudinal horizontal axis below said heat source, said receptacle being of prismatic form and having a polygonal base



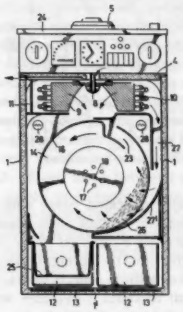
in the form of an inset dihedron, and means for oscillating said receptacle in a rocking motion about said axis.

4,203,358

DEVICE FOR COOKING FOODSTUFFS

Hans Vogt, 8391 Erlau, Passau, Fed. Rep. of Germany

Continuation of Ser. No. 724,732, Sep. 20, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,223
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 2541718
Int. Cl.² A47J *27/00*
U.S. Cl. 99—352 **13 Claims**



1. A device for cooking food which comprises:

an insulated housing;

a heat source;

a gas penetrable hollow cylinder adapted to receive and carry food while the food is being cooked, said cylinder being mounted within said housing for rotational movement in two opposite directions about a horizontal axis, said cylinder being constructed such that food accumulates at a generally fixed location on the interior of said gas penetrable cylinder when said cylinder is rotated in a first direction, said cylinder being further constructed such that it includes a permanently open food receiving and discharging slot-like opening extending along the longitudinal axis of said cylinder and arranged to permit the discharge of said food only during rotation of said cylinder in a second direction opposite to said first direction;

means for rotating said gas penetrable hollow cylinder in said two opposite directions, including means for reversing the rotational direction of said cylinder from said first to said second direction after the expiration of a defined cooking period; and

heat supply means for supplying a heated gas stream from said heat source to the inside of said hollow cylinder, comprising:

a downwardly directed passageway which places said heat source into communication with said cylinder such that

heated gas is delivered to said generally fixed location on said cylinder where food accumulates when said cylinder is rotated in said first direction; said passageway being bordered at one end by an arcuate deflector arranged such that said deflector and the wall of said cylinder converge to reduce the cross section of said passageway in the vicinity of said fixed location to direct a flow of heated air towards said fixed location on said cylinder and into contact with said accumulated food to be cooked.

4,203,359

HYDRAULICALLY DRIVEN PRESS

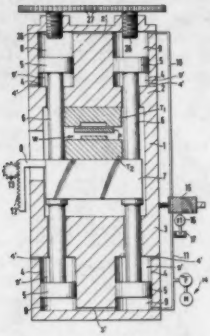
Horst Baltschun, Rülzheim, Fed. Rep. of Germany, assignor to SMG Süddeutsche Maschinenbau-Gesellschaft mbH, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,957

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739340

Int. Cl.[2] B30B *15/16*

U.S. Cl. 100—209 11 Claims



1. A hydraulically operated press which includes a press frame having a first and second cross beam between which a press ram is displaceable by at least two cylinder-piston means operable in two directions by a pressure medium supplied from at least one pressure medium source, characterized in that each cylinder-piston unit includes a cylinder arranged in the first cross beam and in the second cross beam, a piston is displaceably guided in each of the cylinders, each of the pistons has an effective piston surface upon which the pressure medium impinges so as to displace the respective pistons in one direction, and piston rod means connected to the press ram for joining together the pistons of the respective cylinder-piston units, wherein a working space is provided between the press ram and the first cross beam and between the press ram and the second cross beam, characterized in that the press ram executes a working stroke in two directions of movement, an auxiliary drive means is provided for driving the press ram in idle strokes preceding each working stroke in both directions of movement, each cylinder-piston unit includes a cylinder chamber means in the first and second cross beams for accommodating the pressure medium, means are provided for communicating the cylinder chamber means of one of the cylinder-piston units with the cylinder chamber means of the other cylinder-piston unit in the respective cross beams, at least one control valve means is provided for selectively controlling a flow of the pressure medium from the pressure medium source between the cylinder chamber means in the respective cross beams, a first pressure medium conduit means is arranged between the control valve means and the cylinder chamber means of the first cross beam, a second pressure medium conduit means is arranged between the control valve means and the cylinder chamber means of the second cross beam, said control valve means being constructed such that one of the pressure medium conduit means and the cylinder chamber means associated with the respective working stroke directions are selectively connected to the pressure medium while the other pressure medium conduit means associated with the other cylinder chamber means is relieved of the pressure medium.

4,203,360

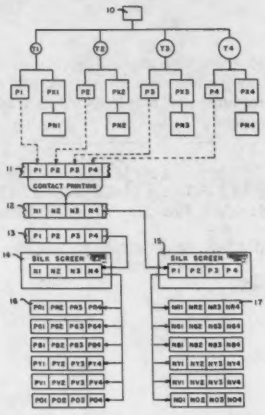
METHOD FOR SILK-SCREEN PRINTING

Steven R. Madwed, 11 Woody La., Fairfield, Conn. 06430

Filed May 5, 1977, Ser. No. 794,064

Int. Cl.[2] B41N *1/24*

U.S. Cl. 101—129 9 Claims



1. A method of making a multicolor silk screen print of a subject transparency of an image which includes the step of exposing said subject transparency for a plurality of time periods to make a series of trial transparencies of different intensities corresponding to the exposed time period, assemblying said trial transparencies of varying intensity onto a film strip, forming a negative transparency strip and a positive transparency strip of said trial transparency on said film strip, making a plurality of monochromatic color trial transparencies strips from each of said negative and positive transparency strips by silk screen printing wherein each of said color trial transparency strips has thereon a plurality of image of varying intensities of like monochromatic color formed thereon, and superposing said negative color transparency trial strips and positive color transparency trial strips on one another for viewing any combination of superimposed images thereon to form a desired composition of said superposed images.

3. A method of making a multicolored print of a subject transparency of an image which includes the step of exposing said subject transparency for a plurality of time periods to make a series of trial transparencies of different intensities corresponding to the exposed time period, assemblying said trial transparencies of varying intensities onto a film strip, forming a negative transparency strip and a positive transparency strip from said trial transparency film strip; making a screen of each of said negative and positive transparency strips; making a plurality of monochromatic color trial transparency strips from each of said screens by printing through said screen the appropriate color media wherein each of the trial transparency strips has thereon a plurality of images of varying intensities of like monochromatic color thereon; and superposing said trial transparency strips one on the other for viewing any combination of superimposed images thereon to form a desired composition of said superimposed images.

4,203,361

SHEET-FED ROTARY PRINTING MACHINE

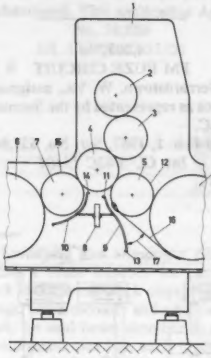
Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,451

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724856

Int. Cl.[2] B41F 7/10, 21/00; B65H 5/12

U.S. Cl. 101—177 2 Claims



1. Sheet-fed rotary printing machine having a plurality of rotatable sheet transfer drums forming a sheet travel path between respective printing units of the machine having a respective rotary impression cylinder, comprising a plurality of stationary sheet guide plates disposed below the sheet transfer drums and extending across substantially the entire width thereof, the impression cylinder being disposed in the sheet transfer path downstream of one of the sheet transfer drums and upstream of another of the sheet transfer drums, the one sheet transfer drum being a sheet turning drum disposed directly upstream of the impression cylinder in the sheet transfer path, said stationary sheet guide plates including a first sheet guide plate extending toward the periphery of the one sheet transfer drum in direction of rotation thereof, and a second sheet guide plate extending away from the periphery of the another sheet transfer drum in direction of rotation of the another sheet transfer drum, the plurality of sheet transfer drums including a third drum disposed immediately upstream of the one sheet transfer drum in the sheet transfer path, said first sheet guide plate approaching toward the periphery of the one sheet transfer drum in rotary direction of the one sheet transfer drum and extending substantially equidistantly from the periphery of the one sheet transfer drum in vicinity of the impression cylinder, said first sheet guide plate having a substantially sinusoidal shape over the length thereof and having an end portion facing toward the third sheet transfer drum and extending downwardly and substantially radially to the one sheet transfer drum so as to form, during rotation of the respective sheet transfer drum at any speed, an air cushion between the respective sheet guide plate and the underside of a sheet being transferred on the respective sheet transfer drum thereabove.

4,203,362

ADJUSTABLE SELF-INKING STAMPING DEVICE

James L. Underwood, Kennesaw, Ga., and Sol Shapiro, Charlotte, N.C., assignors to Adjusta-Mounts, Inc., Atlanta, Ga.

Filed Nov. 2, 1978, Ser. No. 957,138

Int. Cl.[2] B41F 1/38

U.S. Cl. 101—327 7 Claims

1. A manual self-inking stamping device comprising:

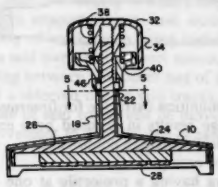
(a) base means for contacting material to be stamped, said base means having a downwardly open recess therein,

(b) stamp pad means disposed within said recess of said base means for relative vertical movement with respect thereto, said stamp pad means having a shaft fixed thereto and extending outwardly through said base means,

(c) handle means mounted at the extending end of said shaft for vertical movement therewith, said handle means being selectively positionable along the length of said shaft;

(d) stop means disposed in the vertical path of movement of said handle means for abutment therewith during downward vertical movement thereof,

(e) biasing means disposed intermediately of said handle means and said base means for urging said handle means away from said stop means and said base means, and for normally biasing said stamp pad means upwardly within said recess of said base means, and



(f) selectively operable locking means associated with said shaft for movement between an operating disposition in which said locking means simultaneously engages said handle means and said base means to lock said handle means against said positioning movement thereof along said shaft, whereby said handle means may be depressed against the biasing force of said biasing means to cause said stamp pad means to contact the material to be stamped, and an adjusting disposition in which said handle means may be selectively positioned along said shaft to vary the effective length of said shaft between said handle means and said stop means and thereby vary the distance said handle means may be moved vertically downwardly before abutting said stop means so that the resulting stamping pressure exerted against the material to be stamped is correspondingly varied.

4,203,363

SHEET GRIPPER FOR PRINTING CYLINDER AND THE LIKE

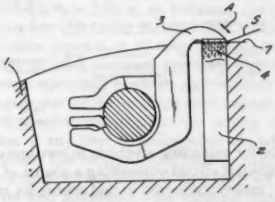
Siegfried Walter, Radebeul; Michael Schneider, Dresden, and Hartmut Nagel, Coswig, all of German Democratic Rep., assignors to Polygraph Leipzig Kombinat fuer Polygraphiscje Maschinen und Ausrüstungen, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 780,245, Mar. 22, 1977, abandoned. This application Apr. 6, 1977, Ser. No. 785,085

Claims priority, application German Democratic Rep., Mar. 22, 1976, 4119195

Int. Cl.[2] B41F 21/04

U.S. Cl. 101—409 7 Claims



1. In a sheet gripper for a sheet-displacing apparatus wherein

a pair of gripper elements have faces engageable with each other to grip a sheet, the improvement wherein at least one of said gripper elements is formed at its respective face of a relatively soft elastomeric material in which is embedded a multiplicity of relatively hard but flexible fibers extending from the respective face toward the other face.

4,203,364

CARTRIDGE FOR REDUCING BORE EROSION AND EXTENDING BARREL LIFE

Herbert H. Dobbs, 23 Dupont Way, Wright-Patterson AFB, Ohio 45433

Filed Jun. 16, 1978, Ser. No. 916,167
Int. Cl.[2] F42B *31/02*
U.S. Cl. 102—38 WR **2 Claims**

1. An ammunition cartridge for firearms, whereby the use of said cartridge results in reduced bore erosion and extended barrel life, said cartridge comprising:

an exterior casing,

said casing having a projectile at one end and detonating means at the other end,

said casing being substantially filled with an explosive propellant,

said cartridge having a rupturable coolant-lubricant containing capsule positioned immediately behind said projectile within said casing, said capsule being substantially cylindrical and having front and rear walls and a coolant-lubricant contained therebetween,

said front wall being very thin so as to rupture and release said lubricant when said cartridge is detonated,

said rear wall being comparatively thick and biconcave in cross section so as to resist collapse when said cartridge is detonated,

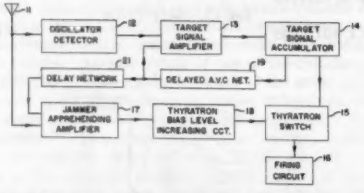
said capsule, when ruptured, serving as a piston to keep powder gases separated from said liquid around the base of said projectile and forcing said liquid to flow between said projectile and the surface of the bore of the firearm barrel.

4,203,365

JAMMER APPREHENDING AMPLIFIER FOR PROXIMITY FUZES

Bradshaw Burnham, Rochester, N.Y., and Charles F. Nichols, Webster, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 20, 1956, Ser. No. 611,084
Int. Cl.[2] F42C *13/04*
U.S. Cl. 102—214 **9 Claims**



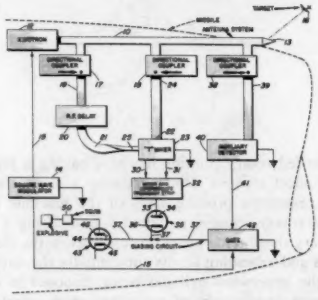
1. A device for exploding a vehicle in proximity to a target, a proximity control circuit comprising a source of electromagnetic energy, means connected to said source for radiating said energy into space and for intercepting electromagnetic energy therefrom, including any portion of said radiated energy reflected from a target, first circuit means connected to said source and being selectively responsive to said reflected energy for generating an initiating signal, normally ineffective electroresponsive means connected to said last named means for actuating a firing mechanism upon being rendered effective by said initiating signal, and second circuit means connected to said source and to said electroresponsive means being selectively responsive to intercepted energy other than said reflected energy for maintaining said electroresponsive means ineffective until a predetermined time after interception of said other energy.

4,203,366

FM FUZE CIRCUIT

Gilbert Wilkes, Gerrardstown, W. Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 1, 1957, Ser. No. 637,846
Int. Cl.[2] F42C *13/04*
U.S. Cl. 102—214 **6 Claims**



1. A microwave proximity fuze for a missile, comprising, a radio transmitting-receiving system including a waveguide having at one end a klystron with a repeller electrode and an antenna at the other end thereof, means including a square wave modulator for sending a predetermined sequence of voltage pulses to the repeller of said klystron to produce corresponding but well-defined frequency changes in the output signals from said klystron, said output signals being transmitted through said waveguide and radiated by said antenna into free space and intercepted and reflected back to said antenna by a target, a pair of directional couplers, one of said couplers being responsive only to transmitted signals and the other said coupler being responsive to received signals reflected from said target, means including a balanced mixer having its input channels connected to receive said signals from said couplers, means including crystal detectors mounted in the output channels of said balanced mixer, means including an intermediate frequency amplifier for receiving the output signals from said crystal detectors, means including a diode for receiving a unidirectional voltage signal from said intermediate frequency amplifier, an auxiliary detector, a third directional coupler associated with said waveguide for transmitting outgoing signals to said auxiliary detector, said auxiliary detector producing a rectified transmitted signal, means including a gate electrically associated with said auxiliary detector and said diode as well as said square wave modulator to give a negative bias on the cathode of said diode, said bias on said cathode of said diode being determined jointly by the voltage derived from the rectified transmitted signal from said auxiliary detector and the voltage from said square wave modulated, and a firing circuit for said fuze including a squib and a thyratron tube having an anode, a cathode and a control grid for also receiving said negative bias, said thyratron causing detonation of said squib whenever the negative bias of said control grid

becomes reduced sufficiently to permit a discharge to occur between its anode and cathode.

4,203,367

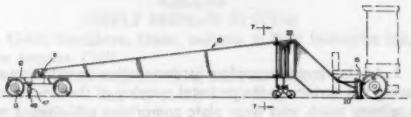
LIFT AND LINE BEAM EXTENSION

John K. Stewart, and Helmuth von Beckmann, both of Columbia, S.C., assignors to Canron Corp., Columbia, S.C.

Continuation of Ser. No. 663,194, Mar. 1, 1976, abandoned, which is a continuation of Ser. No. 572,707, Apr. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 397,817, Sep. 17, 1973, abandoned. This application Apr. 30, 1979, Ser. No. 34,950

Int. Cl.[2] E01B *33/06*

U.S. Cl. 104—7 B **26 Claims**



1. A device for lifting and aligning a railroad track, said device comprising a beam member for extending longitudinally of the track and having track engaging wheels mounted at a first end of said beam member and a pair of reaction blocks, one for each rail, on said beam member in the region of the second end of said beam member, each reaction block having a laterally facing flange for engaging a side of a rail head; a track position correcting frame, including means for laterally shifting the track, carried on said beam member between said reaction blocks and said first end and closer to said reaction blocks than to said first end; and means to connect said second end of said beam member to a propelling vehicle and including a mounting for said second end of said beam member adapted to maintain the rail engaging reaction blocks slightly clear of the rail heads when the beam member is unloaded and which permits the reaction blocks to engage the rail heads to react to an applied load.

4,203,368

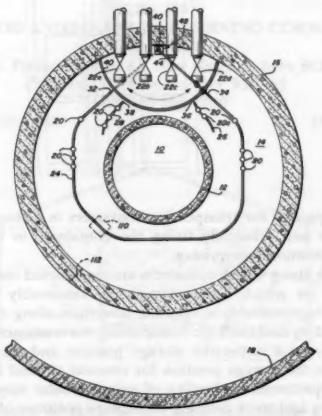
LOAD HANDLING SYSTEM

Albert R. Haskins, 1621 Walnut St., Park Ridge, Ill. 60008

Filed Jan. 21, 1977, Ser. No. 761,148

Int. Cl.[2] B61B *3/00*

U.S. Cl. 104—92 **7 Claims**



1. In a load-handling system of the type wherein monorail tracks are suspended from overhead support means to overlie a service area having a perimeter defined by the wall of a building, said system including a transfer track having one end disposed adjacent said wall, pivot support means pivotally mounting said one end of the transfer track adjacent said wall above said service area, the other end of said transfer track extending into and overlying said service area and being movable along an arcuate path overlying a substantial portion of said service area as the transfer track is pivoted about said pivot support means, means for supporting said other end of said transfer track including an arcuate support track suspended from said overhead support means in general alignment with said arcuate path, and carrier means movably interconnecting said other end of said transfer track with said arcuate support track, said system further including a plurality of tracks suspended from said overhead support means and individually overlying said service area, each of said tracks having an end terminating adjacent said arcuate support track and with all of said track ends converging toward a common point coaxial with said pivot support means, said arcuate support track and said plurality of tracks each being individually suspended directly from said overhead support means, and means for effecting a coupling between said other end of said transfer track and the end of a selected one of said tracks, whereby a load supported on one of said tracks can be moved onto said transfer track for movement to another one of said tracks.

4,203,369

TRANSPORTATION SYSTEMS

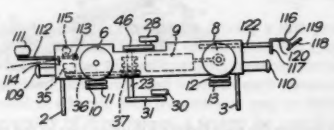
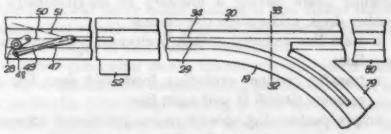
Francis C. Perrott, The Manor House, South Cerney, Cirencester, Gloucestershire, England

Filed Sep. 27, 1977, Ser. No. 837,213

Claims priority, application United Kingdom, Sep. 28, 1976, 40122/76; Jan. 15, 1977, 1639/77

Int. Cl.[2] E01B *7/04, 25/26*

U.S. Cl. 104—130 **11 Claims**



1. A transportation system comprising a guideway, a diverging junction on said guideway, a vehicle movable along said guideway, guidance means for affording guidance to said vehicle for travel thereof to either side of said junction, vehicle-mounted track selection means for selecting which side of the junction the vehicle is to follow, an on-board operating member, an on-guideway operating member and means whereby said track selection means is, at all times, independently operable alternatively by said on-board operating member and by said on-guideway operating member, and retained in position to select a chosen side of the junction until changed by either of said operating members, whereby the setting of the track selection means at any time depends solely on which of the operating members has most recently been encountered.

8. A transportation system comprising a guideway, a diverging junction on said guideway, two vehicles movable along said guideway, guidance means for affording guidance to said vehicles for travel thereof to either side of said junction, vehi-

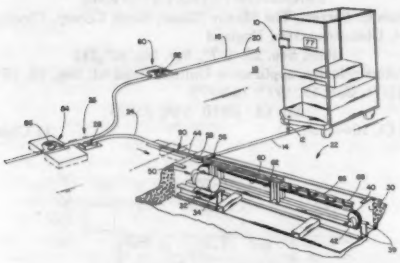
cle mounted track selection means for selecting which side of the junction each vehicle is to follow, and an on-board operating member for operating said track selection means, wherein each vehicle has a buffer and a coupling member at one end. one of the coupling members comprises a roller with a part-spherical surface and a vertical axis, and the other coupling member has a part-cylindrical surface which is a portion of a cylinder having a radius of curvature in a vertical plane which is substantially the same as that of the part-spherical surface and adapted to be engageable therewith when the coupling formed thereby is in tension, the sides of the part-cylindrical surface of said other coupling member being unbounded whereby if the vehicles select and follow different sides of a junction, they automatically become uncoupled by the transverse relative motion of said roller relative to said part-cylindrical surface.

4,203,370

IN-FLOOR TOWLINE AUTOMATIC RE-ENTRY SPUR

Martin B. Sapila, Belle Mead, N.J., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Feb. 6, 1978, Ser. No. 875,374
Int. Cl.[2] B60M *1/08;* B61B *13/00*
U.S. Cl. 104—162 **14 Claims**



8. A system for transferring a towline cart of the type including a towpin from a non-powered spur line to a main line of an in-floor towline conveyor, said main line including a powered towline chain having a plurality of longitudinally spaced pusher dogs, said system comprising:

a main line re-entry switch positioned adjacent said main line;

a transfer channel extending from said spur line to said re-entry switch at said main line;

empty pusher dog spotter means positioned adjacent said main line upstream of said re-entry switch for spotting an empty pusher dog and generating a signal in response thereto;

transfer means positioned adjacent said spur line and including a flexible, extendable and compressible transfer member having ends, said transfer means being engageable with a cart towpin and movable between a first position adjacent said spur line to a second position adjacent said main line for transferring a towcart from said spur line along said transfer channel to said main line re-entry switch in response to the empty pusher dog signal generated by said spotter means; and

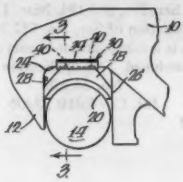
a towpin spotter means positioned adjacent said main line downstream of said re-entry point of said main line for sensing receipt of the towpin of said transferred cart in a main line pusher dog and generating a signal in response thereto indicating that the cart has been transferred to said main line and causing return of said transfer member to said first position.

4,203,371

RESILIENT PEDESTAL WEAR PLATE

Carl E. Tack, Elmhurst, Ill., assignor to Transdyne, Inc., Chicago, Ill.

Filed Jul. 7, 1978, Ser. No. 922,749
Int. Cl.[2] B61F *5/32, 5/38, 5/50*
U.S. Cl. 105—225 **7 Claims**



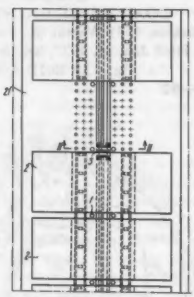
1. An improved wear plate for installation on a downwardly facing flat surface in the pedestal opening of the side frame of a railway truck, said wear plate comprising a U-shaped member for covering and protecting said surface, a pair of lips extending upwardly from opposite sides of a base, said lips being resiliently engageable in clamped relation with opposite sides of the side frame above said flat surface of said pedestal opening to hold said base in position, said base having a slight convex shape relative to said downwardly facing surface prior to the installation thereof, such that after installation, said base reliably conforms to said flat surface.

4,203,372

CONTAINER SECURING DEVICE

Jury N. Ivanov, Oruzheiny pereulok, 5-9, kv. 60; Konstantin V. Artemov, Nizhegorodskaya ulitsa, 21, kv. 29; Leonid I. Suris, Smolnaya ulitsa, 31, kv. 85, and Jury F. Bozhenov, Leningradsky prospekt, 50, kv. 30, all of Moscow, U.S.S.R.

Filed Dec. 14, 1977, Ser. No. 860,372
Int. Cl.[2] B60P *7/08;* B61D *45/00;* B61J *1/22;* B64D *9/00*
U.S. Cl. 410—67 **3 Claims**



1. Apparatus for transporting containers in a storage compartment and releasably fixing the containers in individual storage positions comprising,

a track along which containers are transported individually and on which the containers are removably stored, a carriage movable in opposite directions along a path defined by said track for transporting the containers sequentially to a respective storage position and for removal from the storage position for removal thereof from said compartment, a plurality of paired tubular stops spaced along said track defining the storage positions of the individual containers and against which individual containers bear, said paired stops holding individual containers stationary in the storage position thereof, each said stop

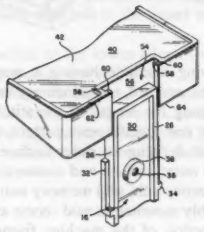
comprising a tubular rod biased to an extended position extending above the level of said track to hold the containers stationary between each two successive stops, each tubular rod having an internal spring biasing it to said extended position, lock means on each said stop actuated by said carriage when travelling in said one direction for retracting the individual stop to said retracted position, lock means automatically releasably locking the stops individually when actuated to said retracted position, means for releasing each said lock means under control of said carriage to allow the corresponding stop to assume its extended position when said carriage travels in an opposite direction.

4,203,373

SHELF DISPLAY SYSTEM

Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 11, 1978, Ser. No. 933,007
Int. Cl.² A47B 5/00, 9/00
U.S. Cl. 108—152 **2 Claims**



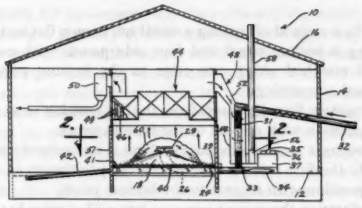
1. A shelf display system adapted to be wall mounted and including a bracket having at least one pair of laterally positioned projections protruding therefrom each projection incorporating at one end thereof a lip, a reversible shelf unit including a substantially planar member bounded by extended side wall elements, said elements projecting well above one surface of the member and having at least one slot of a T configuration along one side thereof, said slot being engaged and retained upon the bracket by said projections and lips.

4,203,374

METHOD AND MEANS FOR BURNING CORNCOBS AND CORN

Charles V. Frederick, Rte. #5, New Virginia, Iowa 50219

Filed Jul. 17, 1978, Ser. No. 924,995
Int. Cl.² F23G 7/00
U.S. Cl. 110—258 **15 Claims**



1. A device of the type described, comprising, a support means,

a floor means extending over a portion of said support means,

said floor means extending upwardly and inwardly from the pripheral portion thereof to an open central portion,

a first conveyor means having its intake end in operative communication with the material to be burned and its discharge end in communication with said open central portion for conveying the material to be burned upwardly through said central opening for deposit on said floor means around said central opening in a mound which substantially terminates short of the peripheral portion of said floor means,

said floor means including multiple perforations which are large enough to permit the upward flow of air therethrough but small enough to substantially resist the downward passage of material to be burned and ashes therethrough,

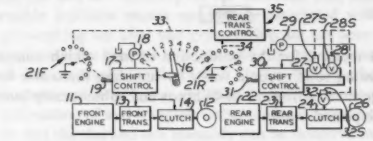
and a second conveyor means extending around the periphery of said floor means for conveying the ashes of the burned material away from said floor means.

4,203,375

ELECTRONIC SWITCHING CONTROL FOR REAR TRANSMISSION

Robert G. Miller, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 11, 1977, Ser. No. 823,768
Int. Cl.² B60K 20/16; F16H 37/06
U.S. Cl. 74—335 **44 Claims**



1. In a vehicle having a first engine driving a first ground-engaging member through a master transmission and a second engine driving a second ground-engaging member through a slave transmission and clutch and wherein each transmission has a shift control wherein each transmission may be shifted to provide a plurality of drive ranges, a system for coordinating said transmissions comprising:

first signal-generating means operatively associated with said master transmission for generating signals indicative of the particular drive range existing in said master transmission, said signals being uniquely different for each of the drive ranges of said master transmission,

second signal-generating means operatively associated with said slave transmission for generating signals indicative of the particular drive range existing in said slave transmission, said signals being uniquely different for each of the drive ranges of said slave transmission,

signal-responsive means responsive to the signals from said first and second signal-generating means for generating an up signal if the drive range indicated by the signal from said first signal-generating means is higher than the drive range indicated by the signal from said second signal-generating means and for generating a down signal if the drive range indicated by the signal from said first signal-generating means is lower than the drive range indicated by the signal from said second signal-generator,

an up solenoid operatively associated with the slave transmission shift control for upshifting said slave transmission when said up solenoid is energized,

a down solenoid operatively associated with the slave transmission shift control for downshifting said slave transmission when said down solenoid is energized,

means responsive to the presence of said up signal for energizing said up solenoid,

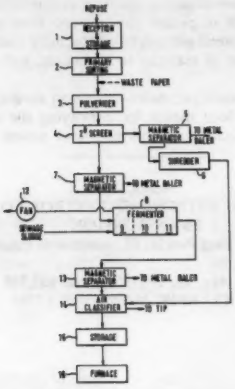
means responsive to the presence of said down signal for energizing said down solenoid.

4,203,376

TREATMENT OF WASTE

Peter Hood, Weybridge, England, assignor to Refuse Derived Fuels (London) Limited, London, England

Continuation of Ser. No. 752,660, Dec. 21, 1976, abandoned.
This application Sep. 18, 1978, Ser. No. 943,602
Claims priority, application United Kingdom, Dec. 24, 1976, 52853/76
Int. Cl.[2] F23G 5/06
U.S. Cl. 110—346 8 Claims



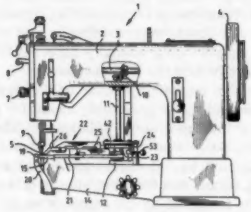
1. A method for the production of heat which comprises composting solid organic waste by tumbling the waste for an average time of from 12 to 48 hours and subsequently burning the composted waste.

4,203,377

SEWING OF A BEAD SEAM WITH LOOSE THREAD LOOPS

Rolf Ludwig, Bielefeld, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Sep. 28, 1978, Ser. No. 946,804
Int. Cl.[2] D05B 15/00
U.S. Cl. 112—58 6 Claims



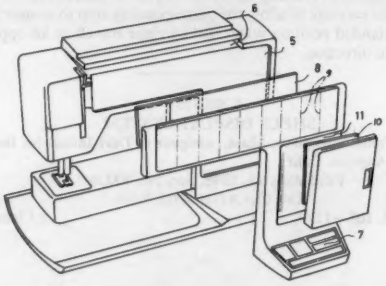
1. In a sewing machine for sewing together two workpiece parts by means of a bead seam, means for providing each stitch with an additional amount of thread for forming said bead seam with loose loops, said means comprising: a loop supporting member located behind the needle of said sewing machine and in the path of stitch formation, and means for imparting loop releasing motions to said loop supporting member after each stitch formation; the motion of said loop supporting member serving only for loop releasing motion and being free of thread measurement.

4,203,378

SEWING MACHINE WITH DATA CIRCUITS

Hannes Giesselmann, and Kenneth Skogward, both of Husqvarna, Sweden, assignors to Husqvarna Aktiebolag, Husqvarna, Sweden

Filed Jun. 29, 1977, Ser. No. 810,946
Claims priority, application Sweden, Jul. 7, 1976, 7607750
Int. Cl.[2] D05B 3/02, 75/00
U.S. Cl. 112—158 E 1 Claim



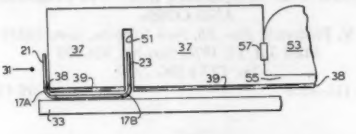
1. A domestic sewing machine having a machine frame comprising a post, arms, and bed, and a memory unit including a code word determining the length of the stitch and being associated with at least one specific seam pattern, the machine including a front panel defining an outer surface of the machine, a recess in said outer surface and connecting means in said recess for said memory unit, said memory unit comprising a plug-in unit detachably mounted in said recess and a further recess in the front portion of the machine frame's overarm section, said front panel being a separate element from the machine and fitted within said further recess.

4,203,379

METAL TUB MADE FROM FLAT METAL SHEETS

Theodore C. Lambertson, 2 Lombardi, Millbrae, Calif. 94030

Filed Jul. 27, 1978, Ser. No. 928,354
Int. Cl.[2] B21D 51/18
U.S. Cl. 113—120 B 7 Claims



1. In a method of making a metal tub from a flat metal sheet having a bottom panel and four side panels with each side panel attached along one edge to the bottom panel, said method comprising,

pressing a first side panel from the flat position to an upright position with respect to the bottom panel,

pressing a second side panel which is immediately adjacent to the first side panel from the flat position to an upright position with respect to the bottom panel,

performing the second pressing step with a press having the same upper die for the second pressing step as used for the first pressing step, said upper die having a slot which receives and permits movement of the first upright side panel within the slot during the second pressing step, and

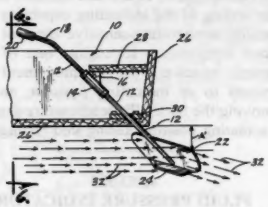
connecting the adjacent edges of the upright side panels.

4,203,380

RUDDER ASSEMBLY

Keith B. Borglum, 218 Loma, Waterloo, Iowa 50701

Filed Mar. 14, 1978, Ser. No. 886,413
Int. Cl.[2] B63H *25/00*
U.S. Cl. 114—144 R 5 Claims



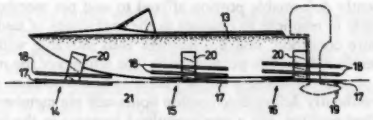
1. A rudder assembly for a boat comprising;
a rudder shaft, said rudder shaft being inclined downwardly and rearwardly;
means for rotatably mounting said rudder shaft to said boat;
a rudder blade attached to the lower end of the said rudder shaft;
a plate attached to the lower edge of said rudder blade and disposed normal thereof; and
said rudder blade is disposed at an oblique angle to the axis of rotation of said rudder shaft, so that said rudder blade passes through several horizontal planes as said rudder blade is rotated by said rudder shaft.

4,203,381

WATER FOIL

Felix Wankel, Fraunhoferstr. 10, 899 Lindau (B), Fed. Rep. of Germany

Continuation of Ser. No. 697,780, Jun. 21, 1976, abandoned, which is a division of Ser. No. 588,519, Jun. 19, 1975, abandoned. This application Nov. 18, 1977, Ser. No. 852,680
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1974, 2429669; Aug. 20, 1974, 2439822
Int. Cl.[2] B63B *1/24*
U.S. Cl. 114—274 1 Claim



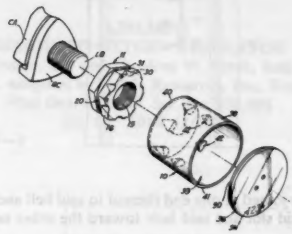
1. A body for movement over the surface of the water, said body having a plurality of foil structures for supporting said body on the surface of the water, which are formed of longitudinal foil strips, each strip not exceeding 100 mm. in width and having a length much greater than its width, and extending in the direction of movement, said foil structures including two structures on each side of said body and spaced longitudinally in the direction of movement with the structures on opposite sides transversely spaced, at least two of said structures opposite each other on the opposite sides being adjacent one end of the body, each of said two opposite, transversely spaced structures being formed by a plurality of said foil strips transversely spaced and parallel to each other, with the foil strips also vertically spaced so said strips of each of said two opposite structures lie at different levels, the strip closest to the body being at the lowest level.

4,203,382

TIRE REMOVAL INDICATOR DEVICE

James P. Mullen, P.O. Box 815, Roswell, Ga. 30075

Filed Dec. 14, 1978, Ser. No. 969,341
Int. Cl.[2] B60R *13/00, 25/00*
U.S. Cl. 116—28 R 8 Claims



1. A device for indicating that a rim and tire assembly has been removed from the lug bolts on a vehicular hub by removal of the lug nuts holding the rim and tire assembly on the lug bolts comprising:
at least one grooved lut nut defining a peripheral locking groove therearound intermediate its ends and lying in a plane generally normal to the central axis of the lug nut adapted to be screwed onto one of the lug bolts to keep the rim and tire assembly on the vehicular hub; and
frangible indicator means operatively associated with said grooved lug nut after said grooved lug nut has been tightened onto the lug bolt to mount the rim and tire assembly so that removal of said grooved lug nut from the lug bolt for removal of the rim and tire assembly results in the destruction of said frangible indicator means beyond reuse so that the rim and tire assembly can be removed but said frangible indicator means cannot again be operatively associated with the lug bolt and said grooved lug nut after the lug nut is screwed back on the lug bolt to remount a rim and tire assembly on the vehicular hub, said frangible indicator means including a frangible tubular member of limited resilience, and sized to fit over and around the lug nut, said frangible member including a plurality of locks on the inside thereof having a size and shape such that said locks on said tubular frangible member can be forced over said grooved lug nut until said locks engage said peripheral locking groove around the lug nut, the resiliencey of said frangible tubular member being sufficient to force said locks into engagement with said peripheral locking groove around the lug nut so that said tubular member cannot be removed from around the lug nut without fracturing said frangible member so as to prevent reestablishment of said tubular frangible member around the lug nut.

4,203,383

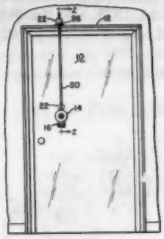
BURGLAR ALARM

Michael D. Hill, P.O. Box 701, Columbia, Tenn. 38401

Filed Jan. 12, 1979, Ser. No. 2,847
Int. Cl.[2] G08B *13/08*
U.S. Cl. 116—95 6 Claims

1. An assembly of components in a kit, said assembly being adapted for assembly together and affixing to a door and door frame as a burglar alarm, said assembly comprising (1) a mechanical bell adapted to be fastened to the inside of a door, (2) a bracket having a slot therein, said bracket being adapted to be

fastened to the top of said door frame, (3) an object having a hole therethrough and adapted to rest on said bracket and (4)



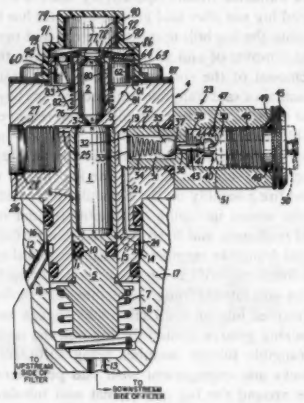
a rod to be joined at one end thereof to said bell and to project through said slot and said hole toward the other end thereof.

4,203,384

MAGNETIC PRESSURE INDICATOR WITH DEACTUATOR FOR BIMETALLIC TEMPERATURE-SENSITIVE ELEMENTS

Bernard F. Silverwater, Plainview, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,669
Int. Cl.[2] G01L 7/16
U.S. Cl. 116—267 **20 Claims**



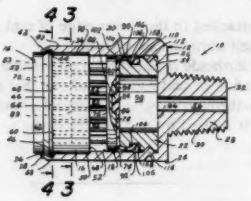
1. A magnetic pressure indicator having provision for testing of the indicating capability thereof without interference by a bimetallic temperature sensitive element with actuation of the device, comprising a housing and, disposed in combination in the housing, a first magnetic means spaced from and arranged to attract or repel a second magnetic means or keeper so long as the two means or the first means and keeper are within their mutual magnetic fields of force; first bias means to retain the first magnetic means towards or away from the second magnetic means or keeper; the second magnetic means being normally retained in a first position; and second bias means to propel the second magnetic means from the first position to an indicating position whenever the spacing distance between the two magnetic means is changed; the first magnetic means being movable in response to changes in pressure, and normally biased toward or away from the second magnetic means by a predetermined force, and the second magnetic means being normally biased by the bias means in a direction away from the first means by a force capable of overcoming the force of magnetic attraction for the first means or the keeper whenever the first and second magnetic means are spaced by a predetermined distance; at least two fluid line connections, one connection leading to one side of the first magnetic means and another connection leading to another side of the first magnetic means, pressure in said line connections tending to move the first magnetic means in opposite directions; at least one sampling port in fluid flow connection with one of the magnetic means for adjustment of fluid pressure to change the spacing distance between the two magnetic means and simulate actuation of the indicator for testing of the indicating capability of the indicator; a bimetallic temperature-sensitive element actuated at a predetermined temperature to engage one of the first and second magnetic means and prevent movement of the second magnetic means to an indicating position; and deactuating means for moving the bimetallic temperature-sensitive element into a non-actuating position during said testing.

4,203,385

FLUID PRESSURE INDICATOR

Robert W. Mayer, Hackettstown, and Adam Smorzaniuk, West Millington, N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 12, 1978, Ser. No. 968,765
Int. Cl.[2] G01L 7/08
U.S. Cl. 116—270 **22 Claims**



1. A fluid pressure indicator for providing visual indication whether or not the magnitude of a fluid pressure condition is above a predetermined minimum value, said indicator comprising a matrix member having a light receiving face which is exposed to view and a rear face and a hole in open communication with both said faces, a pin member including a pin element having a free end facing in the same direction as said light receiving face, said pin member movable between a first extreme position in which said free end is not visible at said light receiving face and a second extreme position in which said pin element is in said hold and said free end is visible at said light receiving face, and a diaphragm having a fixed portion and a resiliently deformable portion affixed to said pin member and movable in response to changes in the magnitude of said fluid pressure condition, said pin member thus movable with said resiliently deformable portion, such that whenever the magnitude of said condition is not in excess of said minimum value, said resiliently deformable portion holds said pin member in its said first position, but a predetermined increase in the magnitude of said condition above said minimum value will deform said deformable portion resiliently, thus to move said pin member to its said second position.

4,203,386

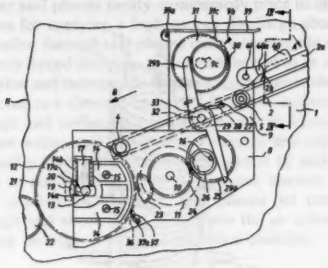
ELECTROSTATIC COPIER WITH INSERTABLE DEVELOPER MODULE

Hanns Blöchl, Unterhaching; Georg Fryda, Munich; Erich Schlick, Riedmoos, and Günther Schnall, Eching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 913,023
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729349
Int. Cl.[2] G03G 15/08, 15/09
U.S. Cl. 118—653 **15 Claims**

1. In an electrostatic copier wherein an original to be copied

is imaged onto the photosensitive surface of an endless rotating charge carrier to form a latent electrostatic image thereon which is then developed by attraction of toner particles to the latent image, a combination comprising a housing; a shaft



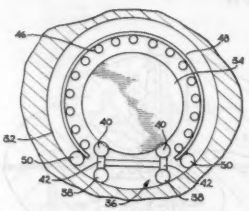
mounting the charge carrier for rotation; and a developing unit insertable in toto into said housing in a position proximal to the charge carrier, said developing station comprising bearing means which embraces said shaft of the charge carrier.

4,203,387

CAGE FOR LOW PRESSURE SILICON DIOXIDE DEPOSITION REACTORS

James McMullen, San Jose, and James Vokac, Oakland, both of Calif., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 28, 1978, Ser. No. 973,736
Int. Cl.² C23C *13/08*
U.S. Cl. 118—715 **10 Claims**



1. A cage for fitting within a reactor and making the flow of gasses along the reactor and around semiconductor wafers positioned approximately coaxially with each other and the reactor more uniform comprising

a plurality of longitudinal members approximately distributed in an arc for fitting within the reactor;

joining means joining said longitudinal members; and

support means coupled to at least one of said joining means and said longitudinal members for supporting said arc defined by said longitudinal members within the reactor so as to be approximately coaxial with semiconductor wafers in the reactor;

said longitudinal members being distributed in an arc of less than 360° so as to leave a lower region open for free passage of boats supporting wafers.

4,203,388

ANIMAL LITTER AND PROCESS

Louis R. Cortigene, and Robert G. Wright, both of Portage, Mich., assignors to Brown Company, Kalamazoo, Mich.

Filed Mar. 31, 1976, Ser. No. 672,471
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **4 Claims**

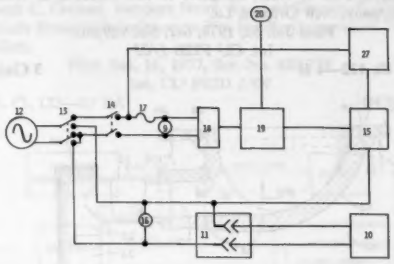
1. Animal litter comprising pelleted and dried cellulose-containing rejects of a paper-making fiber plant and a deodorizer material, said rejects comprising at least about 50 percent of the waste rejects of a secondary paper-making fiber plant consisting essentially of cellulose and mineral filler, and in which said rejects comprise a mixture of said waste rejects and paper broke.

4,203,389

DISSOLVED OXYGEN REGULATOR

Martin J. Gasper, Jr., and Theodore W. Black, both of Allentown, Pa., assignors to Rodale Resources, Inc., Emmaus, Pa.

Filed Oct. 13, 1978, Ser. No. 950,990
Int. Cl.² A01K *63/00*
U.S. Cl. 119—3 **13 Claims**



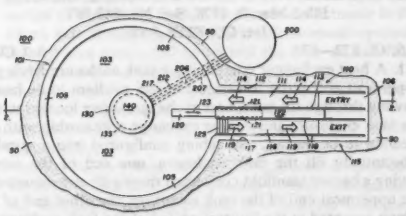
1. An apparatus for controlling the oxygen level in a body of water, comprising: an oxygen sensor means for producing a voltage representative of the amount of oxygen in said body of water; an aerator for spraying water from said body of water over the surface of said body of water; a control means responsive to said oxygen sensor for selectively energizing said aerator; a regulator for producing a first control voltage in response to said output voltage of said oxygen sensor equalling or exceeding a predetermined value and producing a second control voltage when said oxygen sensor output voltage is less than said predetermined value; and switch means responsive to said first and second control voltages for selectively activating and deactivating said aerator.

4,203,390

AQUATIC EXERCISE FACILITY WITH ISLAND

Carl L. Brazelton, Bonfield, Ill., assignor to Stran Corporation, Bradley, Ill.

Filed Jun. 12, 1978, Ser. No. 914,499
Int. Cl.² A01K *15/02*
U.S. Cl. 119—29 **62 Claims**



1. An aquatic exercise facility for animals comprising a container for a pool of water having an animal entry area and an animal exit area, a hollow island mounted in said container generally centrally with respect to said pool of water and extending upwardly therefrom, at least a portion of said pool around said island having a depth sufficient to require an animal to swim therein from said animal entry area to said animal

exit area, whereby an animal entering said pool at said animal entry area must swim at least part way around said island across said deep portion and to said exit area thus to exercise the animal, means mounted within said island for establishing a current of water flowing from the upper portion of said pool of water into the upper end of said island and from the lower end of said island and back into the lower portion of said pool of water, and water filtering mechanism in said island for filtering the current of water flowing through said island thus to clean the water in said pool of water.

4,203,391

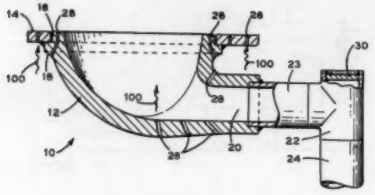
FLUIDIZED BED FUEL FEEDER

Paul S. Knoebel, Clinton, and Jerald M. Wennerstrom, Canal Fulton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 31, 1978, Ser. No. 929,862

Int. Cl.[2] F22B *1/02*

U.S. Cl. 122—4 D **3 Claims**



1. In combination with a vapor generator having a furnace fired by a fluidized bed of granular material, perforated plate means for introducing fluidizing air into the furnace, underfeed means for supplying the material through the plate means comprising at least one discharge conduit, at least one material supply conduit, the discharge conduit having one end communicating with the supply conduit and at least one end communicating with the bed, the discharge conduit having a total cross-sectional flow area substantially greater than the cross-sectional flow area of the supply conduit to substantially reduce the velocity of the granular material entering the furnace, the discharge conduit including a nozzle disposed above the plate means, the nozzle having at least one leg arranged to discharge the material into the furnace transversely to the perforations in the plate means, and a perforated housing enclosing the nozzle, the perforations in the housing promoting fluidization of the bed and cooling of the nozzle.

4,203,392

HEAT EXCHANGER

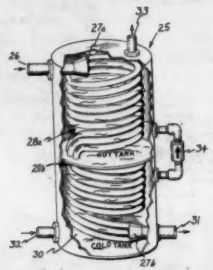
Jack S. McLane, 5589 Crestview Dr., Acworth, Ga. 30101

Filed Mar. 3, 1978, Ser. No. 883,207

Int. Cl.[2] F22B *5/00*

U.S. Cl. 122—17 **1 Claim**

1. A heat exchanger comprising a tank enclosure having an uppermost end and a lowermost end, a medium to be heated flowing through the tank, heat exchange tubing located within the tank enclosure and in heat exchange relationship with the medium to be heated, said tubing configured into a spiral to substantially fill the tank enclosure, one end of the tubing having a burner manifold connected therewith and mounted at the uppermost end of the tank enclosure, the other end of the tubing mounted at the lowermost end of the tank enclosure, a source of heat connected directly to the burner manifold for supplying heat to the interior of the spiral tubing, means associated with the end of the tubing at the lowermost end of the tank enclosure for drawing the heat within the tubing downwardly there through and for exhausting cooled and spent heat to the exterior of the tank enclosure, wherein the tank enclosure is divided into two separate fluid tight compartments comprising a super heat compartment and a reserve compartment, the spiral tubing comprising at least three parallel individual tubes connecting the burner manifold at the uppermost end of the tank enclosure with the lowermost end of the tank enclosure, whereby the medium being heated and the source of heat to the heat exchanger are at their respective greatest



relative temperatures at the uppermost end of the tank enclosure and at their lesser relative temperatures at the lowermost end of the tank enclosure thereby extracting the maximum heating value from the source of heat prior to exhausting thereof.

4,203,393

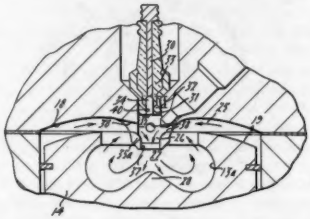
PLASMA JET IGNITION ENGINE AND METHOD

Dante S. Giardini, Dearborn Hts., Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1979, Ser. No. 957

Int. Cl.[2] F02B *17/00, 19/08*

U.S. Cl. 123—30 D **14 Claims**



1. An apparatus for carrying out combustion in an internal combustion engine, said engine having a piston and cylinder effective to define a variable volume space and a main combustion chamber residing as a cavity in the top of the piston and communicating with the variable volume space, said cylinder having an intake port oriented to induce a swirl motion to air inducted into said variable volume space, and said space being varied in volume by said piston during compression to induce a high radially inwardly squish motion to said air to form a circulatory path having an air column entering and extending into the central region of said main combustion chamber and exiting therefrom along the sides, said swirl motion and squish motion cooperating to impart a circulatory transfer motion to charge elements in said main chamber, the improvement comprising:

(a) means defining a shock wave chamber integral with said cylinder and having walls extending into said piston cavity when said piston is in a substantially top dead center condition, said shock wave chamber having an exit and an entrance respectively aligned with the path of the circulatory transfer motion of said charge elements,

(b) means defining a plasma cavity in communication with said shock wave chamber, said plasma cavity having an

orifice communicating with said shock wave chamber at a side opposite from said exit, said orifice being aligned with the exit of said shock wave chamber,

(c) means for injecting fuel into said shock wave chamber during compression so that the charge elements are forced to enter said plasma cavity momentarily prior to ignition,

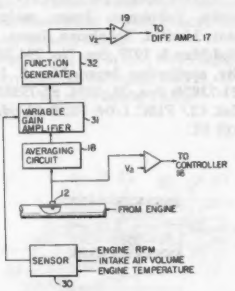
(d) means for applying a high energy discharge about 200 millijoules, through said plasma cavity causing the charge elements forced thereinto to be shock heated to an ionized condition and increased in pressure so that the ionized gas is ejected as a directed body of combusted ionized gases through said orifice, said ionized plasma jet igniting the mixture within said shock wave chamber and extending outwardly from the exit thereof preceded by said shock wave to additionally ignite the gaseous mixture in the main combustion chamber, said plasma jet extending through said shock wave cavity into the air column extending through said main combustion chamber.

4,203,394

CLOSED-LOOP EMISSION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE WITH A CIRCUIT FOR GENERATING OFFSET VOLTAGE THAT CANCELS ERROR INTRODUCED DURING USE

Shigeo Aono, Seki, and Akio Hosaka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 11, 1977, Ser. No. 769,871
Claims priority, application Japan, Feb. 12, 1976, 51-13250
Int. Cl.[2] F02B 3/00
U.S. Cl. 123—32 EE **7 Claims**



1. A closed loop mixture control system for an internal combustion engine having an exhaust gas sensor for generating a signal representative of the concentration of a predetermined constitutent of the exhaust gases from said engine, said gas sensor having a tendency to vary its operation characteristic as a function of aging, a catalytic converter disposed downstream of said exhaust gas sensor for converting the exhaust gases into harmless waste products when the concentration of said constituent gas is maintained within a predetermined range, and means for supplying mixture at a desired air-fuel ration in response to a feedback control signal, comprising:

a first feedback circuit having an input terminal connected to said exhaust gas sensor, an averaging circuit and a first differential amplifier connected in series thereto for generating a first signal representative of the deviation of a mean value of said concentration representative signal from a reference level representing said desired air-fuel ratio;

a second feedback circuit having an input terminal connected to a portion of said first feedback circuit and a control circuit to derive a second signal representative of the deviation of said concentration representative signal from a reference level representing said desired air-fuel ratio, said second signal being modified in amplitude in accordance with a predetermined control characteristic;

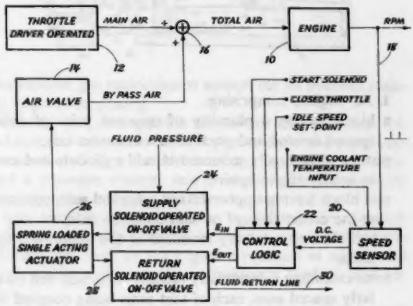
a second differential amplifier having two input terminals connected respectively to the output terminals of said first and second feedback circuits for generating a third signal representative of the difference between said first and second signals, the output terminal of said second differential amplifier being connected to said mixture supplying means to apply said second third signal thereto as said feedback control signal.

4,203,395

CLOSED-LOOP IDLE SPEED CONTROL SYSTEM FOR FUEL-INJECTED ENGINES USING PULSE WIDTH MODULATION

Joseph C. Cromas, Newport News, Va., and Thomas P. Green, South Bend, Ind., assignors to The Bendix Corporation, Troy, Mich.

Filed Sep. 16, 1977, Ser. No. 833,779
Int. Cl.[2] F02D 1/04
U.S. Cl. 123—32 EA **10 Claims**



8. In an electronic fuel injection system for an engine having an engine-driven distributor and wherein said injection system includes a main air passage and a throttle controlling the main air supply to said engine through said air passage and a fuel pump for providing a source of fuel,

an idle speed control including an air valve for controlling a source of air to said engine bypassing said main air passage, a spring-loaded actuator for said air valve in which said spring is opposed by a fluid pressure derived from said source,

electrohydraulic means for controlling fuel pressure from said source to said actuator and from said actuator to a line returning fuel to its source, said electrohydraulic means includes a return solenoid-operated on-off valve connected to control the flow of fuel from said actuator to the return side of said source and a supply solenoid-operated on-off valve connected to control the flow of fuel from said source to said actuator,

means responsive to said distributor for producing a series of pulses varying with the speed of said engine,

means producing a voltage varying with engine coolant temperature,

circuit means receiving said pulses and said temperature-varying voltage producing a direct current voltage varying with engine rotational speed modified with changes in coolant temperature,

a source of regulated direct current voltage and means comparing said regulated direct current voltage with the output of said circuit means,

said comparing means including separate summing amplifiers connected to each of said return and supply solenoid-operated on-off valves, and pulse width modulation means connected to each of said summing amplifiers, said modu-

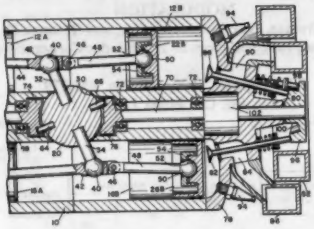
lation means including an oscillator, said comparing means being operative to convert the output of said summing amplifiers to a series of pulses at said oscillator frequency with the width of said pulses being proportional to the magnitude of the outputs of said summing amplifiers.

4,203,396

BARREL ENGINE WITH ROCKING BALL DRIVE

Alfred H. Berger, 4143 Nemaha Dr., San Diego, Calif. 92117

Filed Oct. 19, 1978, Ser. No. 952,620
Int. Cl.[2] F02B *75/26*
U.S. Cl. 123—58 B **9 Claims**



1. An engine, comprising:
a block having a plurality of opposed pairs of cylinders spaced around and parallel to a common axis;
pistons reciprocally mounted in said cylinders and coupled in axially aligned pairs;
said block having opposed fixed spherical seats substantially at the center thereof on said common axis;
a ball element rotatably mounted in and supported by said seats;
arms extending substantially radially from said ball on angularly spaced axes, each of said arms being coupled to one of said pairs of pistons;
a drive pin projecting from said ball and spaced from said arms;
an output shaft rotatably mounted in and extending from said block, said shaft having an eccentric drive connection to said drive pin;
and timing means for controlling sequential operation of said pistons to rock said ball element alternately about different axes.

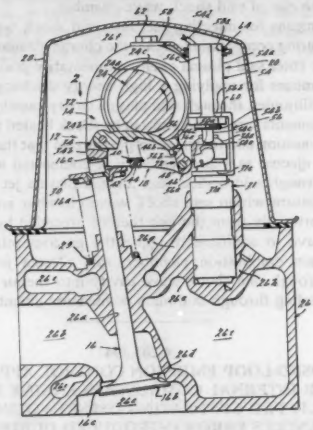
4,203,397

ENGINE VALVE CONTROL MECHANISM

Raymond A. Soeters, Jr., West Bloomfield Township, Oakland County, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 14, 1978, Ser. No. 915,476
Int. Cl.[2] F01L *1/34*; F02D *13/06*
U.S. Cl. 123—90.16 **20 Claims**

1. In an internal combustion engine including at least one cylinder valve; a lash adjuster having a moveable portion for controlling valve train lash in the engine; a camshaft mounted for rotation in the engine and including a circumferential surface defining a first surface portion and a cam lobe projecting radially outward from the circumferential surface and axially adjacent to the first surface portion; a rigid link means supported on its end by the valve and lash adjuster and defining on a surface thereof a first follower means in direct contact with the first surface portion of the camshaft; a second follower means disposed adjacent the first follower means, moveable relative to the rigid link means, and in direct contact with the cam lobe; and latch means selectively moveable to a first position preventing movement of said second follower means relative to the link and a second position allowing such relative movement; wherein the improvement comprises:



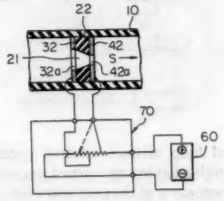
actuation means mounted on the moveable portion of the lash adjuster and selectively operative to move said latch means between said first and second positions.

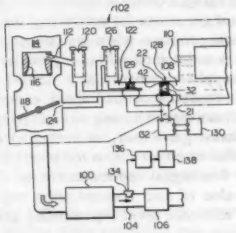
4,203,398

ELECTROSTATIC APPARATUS FOR CONTROLLING FLOW RATE OF LIQUID

Hiroyuki Maruoka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 5, 1977, Ser. No. 794,137
Claims priority, application Japan, May 8, 1976, 51-51694; Jun. 24, 1976, 51-73874; Jun. 28, 1976, 51-75585
Int. Cl.[2] F15C *1/04*; F02B *51/04*
U.S. Cl. 123—119 EC **7 Claims**





1. Apparatus for controlling the volume rate of flow of a liquid in a liquid passage, comprising:
a body of an electrically insulating material fixedly disposed in said liquid passage to occupy and block a section of a

definite length of said liquid passage, said body being formed with a through hole having generally the shape of a truncated cone with its axis in the direction of liquid flow and having a largest cross-sectional area and a smallest cross-sectional area respectively at an upstream end and at a downstream end thereof such that said through hole constitutes a flow-constricting orifice which regulates liquid flow through said passage and determines a base flow rate of liquid therethrough;

a first plate electrode affixed to the upstream end of said body and having a circular aperture axially in alignment with said through hole of said body and of a cross-sectional area not smaller than said largest cross-sectional area of said through hole;

a second plate electrode affixed to the downstream end of said body and having a circular aperture axially in alignment with said through hole of said body and of a cross-sectional area not smaller than said smallest cross-sectional area of said through hole; and

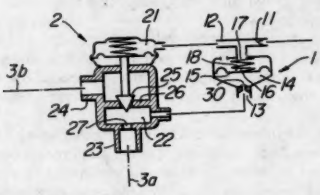
an electric circuit which is connected to said first and second electrodes to produce an electric field in the liquid between said first and second electrodes to thereby impose a propulsive stress on the liquid toward one of said first and second electrodes, and to thereby vary the flow rate of said liquid from said base flow rate, said circuit including a control means for varying at least one of the magnitude and the polarity of a DC voltage impressed across said first and second electrodes.

4,203,399

EXHAUST GAS RECIRCULATION SYSTEM

Shigefumi Nakamura, Oobu; Hiromi Tokuda, Nagoya, and Hidetaka Nohira, Mishima, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 6, 1978, Ser. No. 922,589
Claims priority, application Japan, Jul. 11, 1977, 52/91718
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **7 Claims**



1. An exhaust gas recirculation system comprising:

an exhaust gas recirculation passage for recirculating part of the exhaust gases discharged from an engine from an exhaust system to an intake system of the engine;

a control valve for controlling the flow rate of the exhaust gases to be recirculated in response to a pressure signal, said control valve having an internal passage which is part of said exhaust gas recirculation passage, a valve head placed in said internal passsage for changing the flow rate of the exhaust gases to be recirculated and a constant pressure chamber upstream of said valve head;

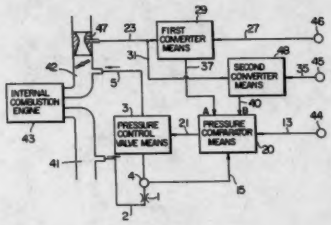
a modulator valve for applying said pressure signal to said control valve, said modulator valve having a diaphragm chamber for controlling said pressure signal, a conduit for connecting said constant pressure chamber with said diaphragm chamber for applying the pressure of the exhaust gases in said constant pressure chamber to said diaphragm chamber; and an orifice means located between said diaphragm chamber and said conduit for controlling the resistance to the flow of the exhaust gases from said diaphragm chamber to said constant pressure chamber to be higher than the resistance to the flow from said constant pressure chamber to said diaphragm chamber.

4,203,400

EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Keigo Yorioka, Oobu, Japan, assignor to Aisan Industry Co., Ltd., Ohbu, Japan

Filed Dec. 6, 1978, Ser. No. 967,153
Claims priority, application Japan, Dec. 13, 1977, 52/149673
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **10 Claims**



1. An exhaust gas recirculation system for an internal combustion engine comprising

(a) exhaust gas recirculation means for recirculating the exhaust gases from an exhaust pipe to an intake pipe, said means including a fixed restriction, a pressure chamber and a pressure control valve means having a pressure control valve arranged in the order named,

(b) first amplification means for amplifying the negative pressure created in a venturi in a carburetor in response to the quantity such as the negative pressure in said intake pipe which represents the variations in load on said engine,

(c) second amplification means for amplifying said venturi negative pressure in response to the quantity such as the negative pressure in said intake pipe which represents the variations in load on said engine,

(d) comparator means for receiving the output pressures from said first and second amplification means and the pressure in said pressure chamber so as to produce the combined pressure of said output pressures which is in proportion to said venturi negative pressure and to compare said combined pressure with said pressure from said pressure chamber, and

(e) control means which cooperates with said comparator means so as to control said pressure control valve, thereby establishing the equilibrium between said combined pressure and said pressure in said pressure chamber.

4,203,401

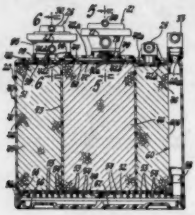
EVAPORATIVE EMISSIONS CANISTER

Charles A. Kingsley, Sterling Heights; James R. Spaulding, Troy, both of Mich., and William E. Gifford, Spencerport, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1979, Ser. No. 7,490
Int. Cl.² F02M *37/00, 33/02*
U.S. Cl. 123—136 **3 Claims**

1. A fuel vapor storage canister for use with a motor vehicle engine and the fuel system therefor to control emission of fuel vapors, said canister including a housing defined by a cylindrical outer wall, a closed lower end wall and an upper end wall, an air-vapor permeable support means operatively positioned to peripherally abut said outer wall in axial spaced apart relation to said lower end wall to define therewith an air chamber; a cylindrical partition wall depending from said upper end wall to said support means to divide said housing above said support

means into an inner canister chamber containing vapor adsorbent material located so as to provide a first vapor chamber adjacent said upper end wall and into an annular outer canister chamber containing vapor adsorbent material located so as to provide an annular second vapor chamber adjacent said upper end wall; air passage means operatively connected to said housing for supplying external atmospheric air to said air chamber; a first vent passage in said upper end wall to said first vapor chamber adapted for connection to the fuel bowl of the carburetor for the engine; a second vent passage in said upper end wall to said second vapor chamber adapted for connection to the fuel tank for the engine; and, a vapor purge valve operatively connected to said upper end wall, said vapor purge



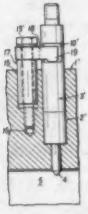
valve having a first orifice inlet and a second orifice inlet, each of a preselected size through said upper end wall for communication with said first vapor chamber and said second vapor chamber, respectively, said vapor purge valve further having a vapor outlet with a purge orifice passage therein connectable to the induction system of the engine and, a vacuum actuated valve means controlling flow of vapor flowing through said first orifice inlet and said second orifice inlet to said vapor outlet, said first canister chamber being in flow communication with said second canister chamber via said atmospheric pressure chamber whereby to effectively reduce vapor back purge between said canister chambers during diurnal purge of vapor from the fuel tank.

4,203,402

MEANS FOR SECURING AN INJECTION NOZZLE

Fritz Freyn, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Aug. 23, 1977, Ser. No. 826,998
Claims priority, application Austria, Aug. 26, 1976, 6346/76
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 AW **4 Claims**



1. Means for attaching an elongated injection nozzle to a cylinder head of an injection-internal combustion engine, which head includes means presenting a nozzle receiving bore in a surface thereof, said attachment means comprising:

means in said head presenting a guide hole disposed adjacent said bore and extending generally in the same direction as said bore, and a threaded bore at the end of said guide hole;

abutment means on said nozzle including a surface extending transversely of the longitudinal axis of the nozzle and facing away from said head;

elongated clamp means having a member at one end disposed in contact with said surface and collar means at the other end presenting an opening disposed in alignment with said guide hole; said collar means integrally including a sleeve-like element elongated in the direction of said guide hole and extending into the latter, said element and said guide hole cooperating to limit movement of said clamp means in directions other than parallel to said guide hole; and

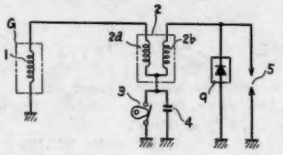
screw means extending through said sleeve-like element and into threaded engagement with the threads of said threaded bore for forcing the member of the clamp means, and thereby said nozzle, toward said head.

4,203,403

IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Hideo Fujii, and Minoru Kato, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 463,429, Apr. 23, 1974, Pat. No. 4,028,844. This application Nov. 8, 1976, Ser. No. 739,800
Claims priority, application Japan, Apr. 28, 1973, 48/51468
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 AC **3 Claims**



1. For a 2-cycle internal combustion engine having at least one spark plug, an ignition device having a generating coil and at least a four-poled rotor for generating a plurality of positive and negative half waves in one rotation cycle and providing a plurality of magnetically neutral points during said cycle;

an ignition coil having a primary winding connected in series with said generating coil and a secondary winding;

breaker contacts connected in series with said primary winding;

cam means synchronized with said engine during a forward rotation of said engine for opening said breaker contacts at the start of said cycle at one of said neutral points while one half wave of said negative and positive waves is being generated at said generating coil to produce an ignition spark at said spark plug and maintaining said breaker contacts open until closing them at a time between the last two of the said magnetically neutral points in a cycle; and

a rectifier connected with said ignition coil so as to prevent voltage being induced in said secondary winding by the other half wave of said positive and negative half waves.

4,203,404

DISTRIBUTORLESS IGNITION METHOD AND SYSTEM FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

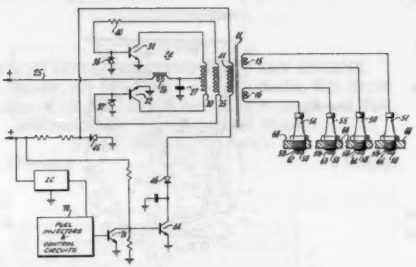
Filed Mar. 13, 1978, Ser. No. 885,844
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 ND **5 Claims**

1. An ignition system for a multi-cylinder internal combustion engine which operates with a combustible mixture in only one cylinder at a time, said cylinders each having a spark plug for igniting said mixture, said system comprising

a transformer having a low voltage primary winding and a plurality of high voltage secondary windings,

said secondary windings each having an independent magnetic path coupling it to said primary winding,

means for controlling current flow in said primary winding in accordance with engine timed conditions related to said cylinders, and



circuit means for directly connecting at least one of said spark plugs to each of said secondary windings for developing simultaneous sparks at all of said spark plugs as determined by said primary winding current control means.

4,203,405

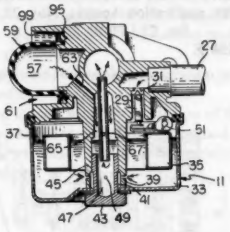
PRIMER

Curtis L. Schultz, Grafton, and Thomas G. Guntly, Hartford, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 25, 1977, Ser. No. 854,816

Int. Cl.² F02M *1/16*

U.S. Cl. 123—187.5 R **12 Claims**



1. The method of supplying an initial charge of fuel-air mixture to a conventionally carbureted internal combustion engine for the purpose of starting that engine comprising:

providing a quantity of fuel within a float regulated fuel supply chamber,

providing a priming fuel chamber within the float regulated chamber, the priming fuel chamber containing a small quantity of fuel and a volume of air overlying the small quantity of fuel,

providing a conduit disposed within and extending upwardly from the surface of the fuel and surrounded by the volume of air in the priming fuel chamber,

manually and abruptly displacing a discrete volume of air from a variable volume chamber, by decreasing the volume thereof, into the priming fuel chamber at a point over the surface of the fuel in the priming fuel chamber so as to displace a discrete quantity of fuel from the priming fuel chamber into the throat of the carburetor in response to an increase in the priming fuel chamber air volume caused by the entry of the air from the variable volume chamber, the volume of air in the priming fuel chamber being less than the volume of the variable volume chamber, and

replenishing the displaced fuel in the second chamber by gravity fuel flow from the float regulated fuel supply chamber.

6. A carburetor for providing a combustible fuel-air mixture to a conventionally aspirated internal combustion engine comprising:

a float regulated fuel supply chamber,

a fuel well within the float regulated chamber and gravity fed from the float regulated chamber, said fuel well having a smaller volume that the float regulated chamber,

a float mechanism within said float regulated chamber for maintaining a predetermined fuel level in said float regulated chamber and said fuel well,

conduit means disposed within and extending upwardly from below to above the fuel level in said fuel well for conveying fuel from the fuel well to air passing through the carburetor and into the engine during normal engine operation, a portion of said conduit means above the fuel level in the fuel well being surrounded by a volume of air,

an air filled variable volume chamber having a normal volume larger than the volume of said fuel well above the fuel level thereof,

operator actuable means for abruptly displacing a discrete volume of air therefrom,

a passageway interconnecting the variable volume chamber and the well above the fuel level whereby a decrease in the chamber volume forces air into the well so as to abruptly lower the fuel level therein and force fuel from the well upwardly through the conduit means, and

means biasing the operator actuable means to return the variable chamber volume to its predecreased volume without drawing fuel from the well into the variable volume chamber.

4,203,406

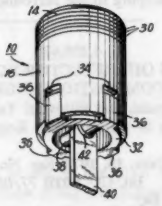
EXPANDING PISTON

William T. Smith, P.O. Box 23, Pratt Station, Brooklyn, N.Y. 11205

Filed Dec. 30, 1977, Ser. No. 866,046

Int. Cl.² F02B *75/30*

U.S. Cl. 123—197 A **6 Claims**



1. In combination, an internal combustion engine having a block with at least one cylinder in said block, a crankshaft, a piston with a crown and a skirt, and a connecting rod connecting the crankshaft to the piston, that improvement comprising:

a sleeve forming part of the piston, said skirt and said sleeve being in a telescoping relationship, the end of said skirt spaced away from said piston crown being provided with a plurality of spaced apart annular vertical slots, said sleeve being provided with a plurality of spaced apart annular vertical tabs, each of said tabs extending into one of said slots, and

means kinematically linking the piston and sleeve to each other and to said crankshaft so that said crown is raised to a maximum elevation relative to said sleeve both at the end of the compression stroke of said piston and the end of the expansion stroke of said piston,

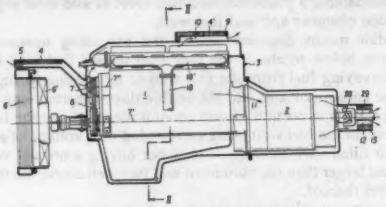
said crown and skirt being lowered to a lower elevation relative to said sleeve as it approaches the center of the stroke and being raised as it leaves the center of the stroke.

4,203,407

INTERNAL COMBUSTION ENGINE WITH A SOUND-REDUCING ENCAPSULATION

Heinz Fachbach; Gerhard Thien, and Karl Kirchweger, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 14, 1978, Ser. No. 933,606
Claims priority, application Austria, Aug. 18, 1977, 5989/77
Int. Cl.² F02B 77/00
U.S. Cl. 123—198 E **5 Claims**



1. An internal combustion engine having a spaced sound-reducing encapsulation, at the encapsulation being provided at least each one air inlet and one air outlet opening, a blower arranged between said openings for ventilation of the inter-space between the engine and the encapsulation, an exhaust system being connected to the engine comprising at least an exhaust manifold being arranged outwardly of the engine encapsulation and exhaust manifold connecting branches, and an exhaust pipe casing being joined to the encapsulation, said casing having air outlet openings at its upper side, at least a part of the exhaust manifold connecting branches also being located outwardly of the engine encapsulation and being enclosed by said exhaust pipe casing, at the exhaust pipe casing there being provided an air discharge duct through which the exhaust pipe extends, said exhaust manifold connecting branches forming in the range of penetration through the side wall of the engine encapsulation each an annular gap with said side wall, in the range of the air outlet openings at the upper side of the exhaust pipe casing there being arranged means to prevent air-transmitted sound from escaping to the surroundings.

4,203,408

LUBRICATING OIL DETECTOR FOR AN INTERNAL COMBUSTION ENGINE

Yoshinobu Yamaguchi, and Hitoyuki Takasu, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 961,020
Int. Cl.² F02B 77/08
U.S. Cl. 123—198 DC **12 Claims**

1. A lubricating oil detector for an internal combustion engine, comprising:

a lubricating oil reservoir adapted to be disposed in a chamber of an internal combustion engine wherein pressure pulsations are produced by reciprocating movement of a piston of the engine;

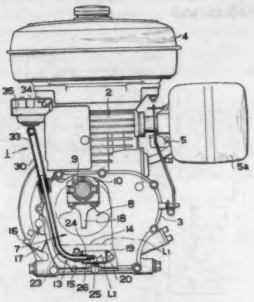
an oil level detecting pipe adapted to extend to the exterior of a crank case of the engine;

said pipe including one end thereof opening in said reservoir;

a pressure detecting actuator adapted to be mounted on the case of the engine, said actuator including valve means;

a connecting tube adapted to connect said valve means of said pressure detecting actuator to said detecting pipe;

said one end of said pipe being disposed in alignment with a predetermined lowest allowable level of oil in said reservoir such that when the oil level in said reservoir falls below said predetermined level said one end of said pipe becomes substantially exposed above the surface of the oil to communicate with said chamber of said engine, whereby the pulsating pressure in said chamber acts through said detecting pipe and said connecting tube to open and close said valve means of said pressure detecting actuator;



said actuator including a first chamber cooperating with said valve means such that pressure is built up therein in response to opening and closing of said valve means; and

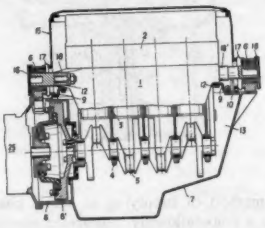
said actuator further including means for stopping operation of said engine in response to pressure built-up in said first chamber of said actuator when the oil level in said reservoir falls below said predetermined level.

4,203,409

LOW-NOISE-LEVEL INTERNAL COMBUSTION ENGINE

Heinz Fachbach; Gerhard Thien, and Peter C. Meurer, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Nov. 16, 1978, Ser. No. 961,411
Claims priority, application Austria, Nov. 23, 1977, 8415/77
Int. Cl.² F02B 77/00
U.S. Cl. 123—198 E **8 Claims**



1. A low-noise-level internal combustion engine comprising a crankshaft and crankshaft main bearings which are engine parts directly affected by body resonance and sound vibration, an engine unit support which supports said crankshaft main bearings, a cylinderhead mounted on said engine unit support, auxiliary units rigidly connected to the engine unit support and to the cylinderhead, and further comprising a crankcase and a flywheel case connected with the crankcase, said engine parts which are directly affected by sound vibration being connected to said crankcase and flywheel case in a resonance-absorbing manner, the engine comprising further a sealing element located between said engine parts which are directly affected by sound vibration and said acoustically insulated engine parts, said sealing element dividing the engine into a lower oil-wetted engine region and an upper dry engine region which is oil-tightly sealed against said lower engine region by

means of said sealing element, the resonance-absorbing connection between the engine unit support and the crankcase being made by at least three resonance-absorbing elements located entirely outside said oil-wetted region and secured to the crankcase, said sealing element surrounding the engine unit support being attached to the engine unit support and to the crankcase having no supporting function and being highly resilient.

4,203,410

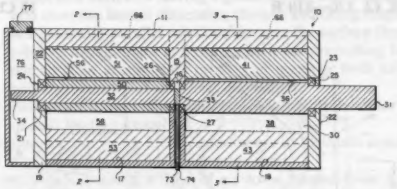
METHOD FOR OPERATING A ROTARY ENGINE

James L. Ramer, 401 W. Newhall Ave., Waukesha, Wis. 53186

Continuation of Ser. No. 740,270, Nov. 9, 1976, abandoned. This application Jun. 7, 1978, Ser. No. 913,415

Int. Cl.[2] F02B *53/08, 53/10*

U.S. Cl. 123—205 **3 Claims**



1. A method of operating a rotary engine having first and second rotors each rotating in a separate chamber, each rotor carrying radially movable vanes, and each chamber having peripherally extending configured walls to determine the extent of radial movement of the vanes said method comprising:

(a) introducing air into a first chamber,

(b) compressing said air upon rotation of said first rotor,

(c) adding fuel into said first chamber,

(d) igniting the compressed air and fuel,

(e) discharging the combustion products from said first chamber without expansion thereof in said first chamber,

(f) introducing the discharged combustion products into said second chamber,

(g) adding additional fuel to the combustion products in said second chamber,

(h) driving said second rotor by expansion of the combustion products and additional fuel in said second chamber, and

(i) exhausting expanded combustion products from said second chamber.

4,203,411

ADDITIONAL CARBURETOR

Jean-Pierre J. Y. Vieille-Mecet, 57, rue du President Coty, Ambares (Gironde), France

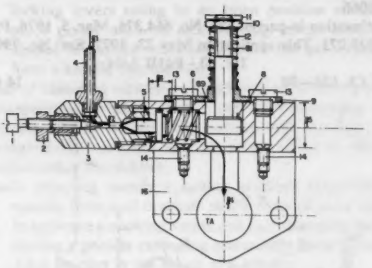
Continuation of Ser. No. 633,016, Nov. 17, 1975, abandoned. This application Jan. 13, 1978, Ser. No. 869,293

Claims priority, application France, Nov. 18, 1974, 74 37967

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—127 **3 Claims**

1. A carburetor system for reducing fuel consumption in internal combustion engines comprising a main carburetor mounted on an intake passageway and having a running jet sized to supply an adequate flow of fuel to the intake passageway for a predetermined level of power, a body mounted on said intake passageway downstream of said main carburetor and having an inlet passageway for receiving fuel under pressure, valving means for opening or closing the inlet passageway, pressure intake means communicating with the intake passageway downstream of the main carburetor for opening said inlet passageway to the intake passageway when the pressure in the intake passageway downstream of the main carburetor is above a predetermined pressure and closing the inlet passageway when the pressure is lower than said predetermined pressure and means for opening the valving means to provide additional fuel to the engine in response to opening of



said inlet passageway to the intake passageway by said pressure intake means.

4,203,412

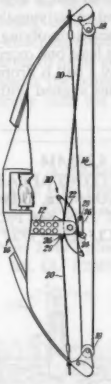
COMPOUND ARCHERY BOW

Lawrence C. Rickard, 116 Pine Tree Ave., Lake Worth, Fla. 33460

Filed May 22, 1978, Ser. No. 907,909

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—23 R **1 Claim**



1. An archery bow in which the draw weight is greatly reduced at maximum draw string displacement comprising:

a bow frame having a pair of bow limbs;

a primary draw string connected to said bow limbs;

a supporting arm connected to said bow frame;

first and second levers rigidly fixed together and rotatably mounted on said supporting arm;

the primary draw string connected intermediate its ends to said limbs and at each end thereof to the respective ends of said first lever;

a pair of limb tensioning strings that are tensioned by operation on said primary draw string, each said tensioning string being connected intermediate its ends to one of said bow limbs and to said second lever ends;

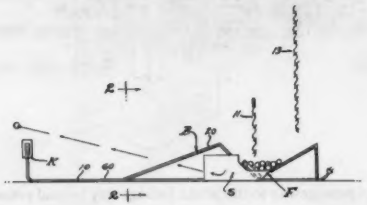
first and second rollers each said roller being pivotally attached to an end of said second lever arm, and said bow frame including an inclined surface rigidly coupled to said support arm to receive one of said rollers when the primary draw string has reached its maximum displacement.

4,203,413

TENNIS BALL FEEDER AND RANDOM SERVER

Kenneth M. Hodges, 3750 Grandview Blvd., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 664,376, Mar. 5, 1976, Pat. No. 4,025,071. This application May 23, 1977, Ser. No. 799,283
Int. Cl.[2] F41B 3/04
U.S. Cl. 124—78 14 Claims



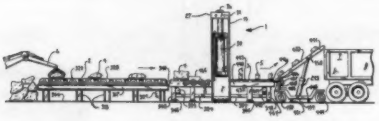
6. A feeder and server for tennis balls of conventional diameter and for emitting said balls to be returned by a player and including; a "V"-shaped feed trough comprised of upwardly divergent back and front walls to receive said balls, a disc-shaped feed plate of substantially lesser thickness than the ball diameter and on an inclined axis normal to and spaced from said front wall of the trough, at least one ball receiver opening through a marginal portion of the feed plate, and the feed plate having a rim projecting therefrom in a direction away from the front wall of the trough a distance substantially half the diameter of the conventional tennis ball, a feed opening through the front wall of the trough and underlying the marginal portion of the feed plate, a motor means revolving the feed plate to sequentially align the said at least one receiver opening with the said feed opening whereby a ball is dropped through the feed opening, and emitter means aligned with the said opening to serve the dropped ball.

4,203,414

STONE CUTTING APPARATUS

Harold F. McClain, 9840 Aberdeen, Leawood, Kans. 66206

Filed Jan. 8, 1979, Ser. No. 1,422
Int. Cl.[2] B28D 1/32
U.S. Cl. 125—23 C 18 Claims



1. In a stone cutting apparatus having a cutting position with an introducing conveyor for moving a stone to the cutting position and a removal conveyor for moving cut stone therefrom, a cutting apparatus at said cutting position in transverse relation to said conveyors and having spaced columns and upper and lower carriages with cutting chisels carried thereby, said carriage being movable for cutting stone between the chisels, the improvement being stone positioning apparatus including:

(a) a stop member extending transversely of the removal conveyor;

(b) means adjustably supporting said stop member for selective positioning from the chisels the width of a cut piece of stone;

(c) a turntable under a path of stone on the introducing conveyor for engaging stone approaching the cutting position and facilitating turning of the stone;

(d) a walker apparatus between the introducing conveyor and cutting position and having a plurality of stationary bars laterally spaced apart and extending toward the cutting position and a plurality of movable bars between the stationary bars; and

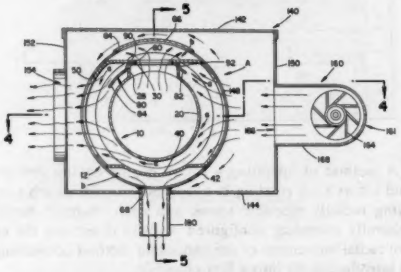
(e) means operatively connected to the movable bars to selectively move the movable bars up and down and toward and away from the cutting position and cooperate with the turntable in maneuvering a stone into engagement with the stop member and in suitable position for cutting a selected piece therefrom.

4,203,415

HEAT EXCHANGER

Thomas J. Gruber, 7700 Fairmount Rd., Novelty, Ohio 44072, and Harris W. Smith, 16839 Savage Rd., Bainbridge, Chagrin Falls, Ohio 44022

Filed Apr. 17, 1978, Ser. No. 896,881
Int. Cl.[2] F24H 3/02
U.S. Cl. 126—110 R 13 Claims



9. A forced air heating system comprising in combination:

a heating system housing including at least a heated air flow outlet;

a heat exchanger recieved in said housing including an inner shell having a side wall, a closed inner end and an outer end for defining a heating chamber with an open ended outer shell generally coaxially disposed around said inner shell and radially spaced therefrom so as to define an air flow passage therebetween over the axially cooperative lengths thereof, said outer shell further including at least a pair of elongated slot areas extending therethrough from one terminal end toward the other terminal end in registry with said inner shell and means for exhausting products of combustion generated in said heating chamber, said exhausting means and heating chamber being placed in gaseous flow communication with each other across said air flow passage by a cross over member;

a fuel burner in operative communication with the outer end of said heating chamber;

means for supplying fuel to said burner to facilitate combustion within said heating chamber; and,

means for directing a flow of air to be heated from a first temperature to a second temperature elevated from the first within said system housing and through said air flow passage in one of an axial and transverse direction relative to said heat exchanger and then outwardly of said housing through said outlet wherein in said axial direction said directing means and heat exchanger are disposed such that at least a portion of said flow of air is directed from adjacent said heating chamber outermost end axially through said air flow passage and wherein in said transverse direction said directing means and heat exchanger are disposed such that at least a portion of said flow of air is directed transversely through said air flow passage between said pair of elongated slot areas in said outer shell.

12. A forced air heating system comprising in combination:

a heating system housing including at least a heated air flow outlet;

a heat exchanger received in said housing including a generally cylindrical inner shell having a side wall, a closed inner end and an outer end for defining a heating chamber with an open ended generally cylindrical outer shell generally coaxially disposed around said inner shell and radially spaced therefrom so as to define an air flow passage therebetween over the axially cooperative lengths thereof, said outer shell further including at least a pair of openings extending therethrough in registry with said inner shell and means for exhausting products of combustion generated in said heating chamber, said exhausting means and heating chamber being placed in gaseous flow communication with each other across said air flow passage by a cross over member;

a thin air flow deflector surrounding said cross over member in said air flow passage intermediate said inner and outer shells, said deflector having a generally arcuate configuration over the lateral dimension thereof and being disposed in a generally parallel relationship over the surface thereof relative to said inner and outer shells for promoting laminar air flow around said cross over member both axially and transversely of said heat exchanger;

a fuel burner in operative communication with the outer end of said heating chamber;

means for supplying fuel to said burner to facilitate combustion within said heating chamber; and,

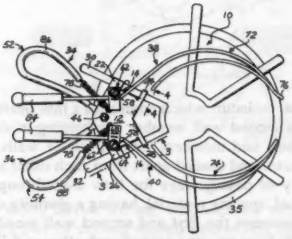
means for directing a flow of air to be heated from a first temperature to a second temperature elevated from the first within said system housing and through said air flow passage in one of an axial and transverse direction relative to said heat exchanger and then outwardly of said housing through said outlet.

4,203,416

MEANS FOR HOLDING A COOKING VESSEL IN POSITION ON A BURNER GRATE

Ralph E. Simpson, Upland, and Michael L. Simpson, Ontario, both of Calif., assignors to Simpson Enterprises, Upland, Calif.

Filed Nov. 25, 1977, Ser. No. 855,026
Int. Cl.[2] F24C *15/10*
U.S. Cl. 126—212 **10 Claims**



1. Holding means particularly suitable for holding a cooking vessel in position over a range burner grate of the type having a plurality of radial bars, said holding means comprising, in combination:

generally flat deck means with lateral edge configurations that interfit with a neighboring pair of the radial bars so as to support the holding means thereon and permit the deck means to span the space therebetween;

a pair of locking levers adapted to pivot about a common pivot point intermediate their ends and means cooperating with said deck means to pivotally support the locking levers at such a point to permit lateral pivoting movement thereof below the deck means;

each of the pivoted locking levers being shaped to extend forwardly from said pivot point and terminate in a foot positioned and adapted to swing laterally outwardly under a separate one of the neighboring pair of radial bars until coming into contact with that bar as the locking levers swing to an open position about said pivot point, each of said locking levers also being shaped to extend rearwardly from the pivot point to form a handle therebehind;

a pair of clamping members respectively secured to a pair of cooperating brackets, and a pair of cooperating pivot means affixed to said deck means, said brackets being respectively mounted on said pivot means in pivoting relationship thereabout;

said clamping members having portions extending forwardly from said brackets in the form of arms adapted to embrace a cooking vessel and each clamping member having a portion extending rearwardly from its cooperating bracket in the shape of a handle;

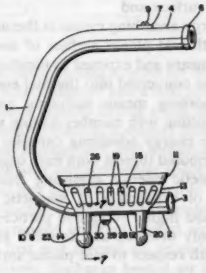
spring means interconnecting said brackets and the handles of said locking levers in such manner as to normally exert simultaneous closing force on the clamping members above said deck means and opening force on the locking levers below said deck means whereby the handles of the locking levers can be squeezed together, against the pulling force of said spring means, until the feet of the locking levers are brought together to fit between a neighboring pair of said radial bars, and whereby said deck means can then be interfitted with the radial bars and the locking lever handles released to permit lateral movement of said feet, under the influence of said spring means, until the feet contact the bars to secure the holding means in position on said grate, and whereby the handles of said clamping members can then be squeezed together to open their forwardly extending arms to receive a cooking vessel, after which the clamping member handles can be released to permit said arms to close around such a vessel placed therebetween, under the pulling influence of said spring means, and thereby hold the vessel in position on said grate.

4,203,417

FIREPLACE HEATER AND GRATE

Donald A. Boyd, Euclid, Ohio, assignor to Cardinal American Corporation, Cleveland, Ohio

Filed Nov. 2, 1977, Ser. No. 847,756
Int. Cl.[2] F23H *13/02*
U.S. Cl. 126—165 **5 Claims**



1. In combination with a fireplace heater comprising a series of vertically-extending laterally spaced convection tubes having air inlet lower portions and air outlet upper portions, a grate of basket-like configuration having supporting legs adapted to support said grate in spaced relation to the floor of a fireplace, said grate having upstanding front and back walls, said lower portions of said tubes extending through said front and back walls, and being in heat-exchanging relationship with fuel in said grate, and means for securing said grate to said

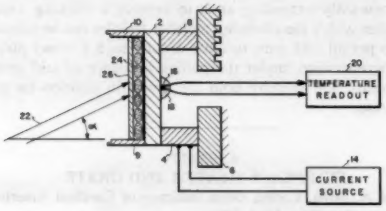
tubes, said means comprising a bar or bracket extending substantially tangentially of the lower portions of said tubes.

4,203,418
EXOTHERMIC COMPOSITION AND HOT PACK
William R. Donnelly, 1237 W. High St., Piqua, Ohio 45356
Filed Aug. 21, 1978, Ser. No. 935,256
Int. Cl.[2] C09K 5/00; F24J 1/02
U.S. Cl. 126—263 10 Claims

1. Particulate material for producing an exothermic reaction when contacted by water, consisting essentially of, in parts by weight, about 90 to about 140 parts anhydrous calcium chloride and about 20 to about 40 parts anhydrous sodium sulfate.

2. A composition including the particulate material of claim 1 and together therewith a solution of anhydrous sodium acetate in water placed in juxtaposition to the particulate material but normally sealed therefrom until a time of use, said composition forming a gel upon contact of said particulate material by said solution and producing a temperature in the environment thereof up to 235° F. by exothermic reaction, the reaction extending for a period of time from about 30 minutes to one hour.

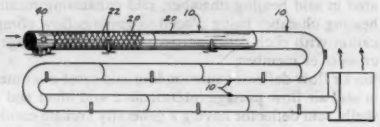
4,203,419
SOLAR CELL
Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation of Ser. No. 647,126, Jan. 7, 1976, abandoned. This application Jun. 14, 1977, Ser. No. 806,536
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—430 5 Claims



1. A solar cell comprising
a thermal energy collecting means having at least one generally planar surface and
a thermal energy absorbing means in thermal energy transfer contact with said planar surface of said thermal energy collecting means and exposed to incident electromagnetic energy to be converted into thermal energy, said thermal energy absorbing means including an electromagnetic energy admitting web member having a plurality of electromagnetic energy admitting capsules substantially uniformly distributed therein with each capsule containing an electromagnetic energy admitting fluid medium and a suspension of a plurality of magnetic field responsive, flake-like, and highly reflective particles in said medium and uniformly oriented and retained at an angle of less than 90° with respect to said planar surface.

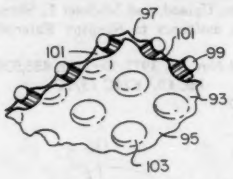
4,203,420
PORTABLE SOLAR HEAT TUBE
James L. Schoenfelder, 415 5th St., Coralville, Iowa
Filed Nov. 25, 1977, Ser. No. 854,667
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—426 3 Claims

1. In combination,
a flexible and inflatable portable solar heat tube having intake and discharge ends,
said solar heat tube having a cylindrical configuration,
the intake end of said heat tube being operatively connected to a source of air for moving air through said heat tube,
the discharge end of said heat tube being operatively connected to an installation requiring heat,
said heat tube comprising a first flexible outer tubular member having high solar transmittance capabilities; a second flexible tubular member positioned within said first tubular member and having heat insulation qualitites; and a flexible absorber tubular member positioned within said second flexible tubular member,



said first flexible outer tubular member being in direct contact with said second tubular member about substantially the entire circumference thereof and said second flexible tubular member being in direct contact with said flexible absorber tubular member about substantially the entire circumference thereof,
said absorber tubular member adapted to convert the incoming sunlight into heat and transfer the heat to the air passing through said heat tube.

4,203,421
SOLAR HEAT COLLECTOR
David M. Bencic, 2731 Galloway Rd., Batavia, N.Y. 14020
Filed Sep. 8, 1977, Ser. No. 831,423
Int. Cl.[2] F24J 3/02; F28F 3/14
U.S. Cl. 126—444 21 Claims

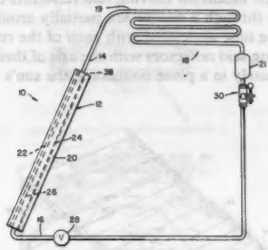


1. A solar heat collector which comprises a thin flexible first wall member, a second wall member conforming in shape to said first member, said members forming major walls of the solar heat collector and spaced apart from each other so as to form a plurality of passageways for flow therethrough of a heat transfer fluid, spacing material, having a plurality of open areas therein, between the first and second wall members to prevent the walls from pressing against each other so fully as to prevent circulation of a fluid through the passages, wherein the first wall member conforms in shape with the spacing material, having depressions matching the open areas thereof, so as to improve heat transfer fluid contact between them, diminish the volume of heat transfer fluid in the passages and rigidify the walls and the solar heat collector.

4,203,422
SOLAR HEATING SYSTEM AND COMPONENT
Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116
Filed Feb. 8, 1978, Ser. No. 876,022
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—417 8 Claims

1. A closed solar heating system comprising a solar collector structure, heat dissipating structure, and means for producing

the circulation of a refrigerant heat transfer medium in gaseous form from the collector structure to the heat dissipating structure to the collector structure, all connected together in operative relationship, a refrigerant heat transfer medium in the system, said heat dissipating structure having a volume capacity sufficient to store all of the refrigerant heat transfer medium in the system when said medium is in liquid form, a thermostatically operated valve provided in the means for producing the circulation of a refrigerant heat transfer medium in liquid form from the heat dissipating structure to the collector structure,



said thermostatically operated valve including means to normally hold the valve in the open position when the temperature of the liquid refrigerant passing therethrough is below a predetermined level, said thermostatically operated valve including means responsive to temperature to cause closing of the valve when the temperature of the liquid refrigerant passing therethrough rises above the predetermined level, said solar collector being located to receive sun rays, said heat dissipating structure being effective to transfer heat to a heat receiving medium during periods of sunlight.

4,203,423

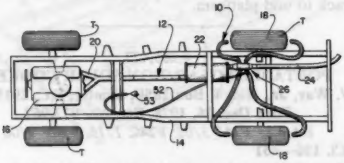
VEHICLE SAFETY DEVICE

Donald C. Ricci, Warwick, R.I., assignor to Sno-Go Inc., Warwick, R.I.

Continuation-in-part of Ser. No. 810,367, Jun. 27, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 930,876

Int. Cl.[2] B60B *39/00;* **F24J** *3/00*

U.S. Cl. 126—271.1 **1 Claim**



1. A safety device for use with a motor vehicle having an engine, a pair of driving wheels operatively associated therewith, an engine exhaust system including an exhaust pipe for receiving and discharging hot exhaust gases from said engine and a muffler connected to said exhaust pipe at an intermediate point thereof comprising, a valve assembly adapted for mounting within said exhaust system, said valve assembly including a body having an inlet for receiving a portion of said exhaust pipe downstream from said muffler, said body also having an outlet for receiving another portion of said exhaust pipe for discharging said exhaust gases from said exhaust system, pairs of conduits terminating at an end thereof adjacent to the tread surfaces of the tires mounted on each of said driving wheels, each of said pair of conduits connected at the other ends thereof to said body in a common connection for communication with the interior of said body, a pair of valve members positioned in said body upstream of the common conduit connections, said valve members being movable to an inclined position with respect to the normal direction of flow of said exhaust gases for directing said exhaust gases through said conduits, and means for operating said valve members for moving them to their inclined position wherein exhaust gases are diverted through said conduits and for returning said valve members to the normal positions thereof, wherein said exhaust gases are discharged through said exhaust pipe, said valve members normally being located in planes parallel to the flow of said gases to said exhaust pipe and being movable by said operating means to the inclined position relative to the flow of said gases, wherein said valve members act to divert said exhaust gases into said conduits, said operating means including a pair of shafts on which said valve members are mounted for movement therewith, said shafts extending through said body exteriorly thereof, a first set of arms joined to said shafts, spring means interconnecting said arms and being operable to normally locate said valve members in the position that closes communication to said conduits, a second set of arms joined to said shafts, and a flexible cable interconnected to said second set of arms for pivotally moving said second set of arms, wherein said shafts are rotated to move said valve members to the position that diverts said gases into said conduits.

4,203,424

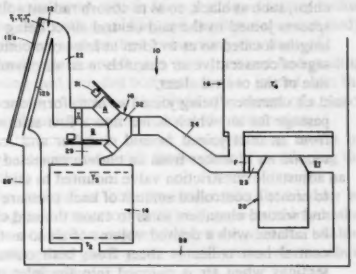
SOLAR HEAT AIR SYSTEM

DeWayne Coxon, and Timothy P. Gates, both of Cedar Springs, Mich., assignors to Jordan College, Cedar Springs, Mich.

Filed Jan. 3, 1978, Ser. No. 866,546

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—422 **5 Claims**

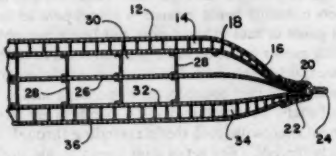


1. In a forced air solar heating system for an environmental space, including a solar collector and a heat storage unit; an air flow handler and mixer control having a first chamber communicable with said solar collector, a second chamber communicable with said heat storage unit, and a third mixing chamber communicable with said environmental space; a first air propulsion unit for said first chamber, arranged to draw heated air from said solar collector; a second air propulsion unit for said second chamber arranged to draw heated air from said heat storage unit; said first and second air propulsion units being arranged to selectively discharge heated air into said mixing chamber; means for selectively operating said first propulsion unit, said second propulsion unit, or both said propulsion units, and means for selectively controlling flow from said first and second propulsion units, whereby heated air can be alternately supplied to said environmental space from said solar collector by said first propulsion unit, or from said storage unit by said second propulsion unit, or mixed from both said solar collector and said storage unit in said mixing chamber by both said first and said second propulsion units.

4,203,425
INFLATABLE SOLAR COLLECTOR

Dana A. Clark, Washburn Rd., Barre, Mass. 01005

Filed Jul. 31, 1978, Ser. No. 929,217
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—426 3 Claims



1. An inflatable solar heat collector unit in which air may be circulated under pressure as a heat collecting medium and a means of inflating the collector unit, comprising an assembly of flexible plastic sheets joined together by spacers formed of flexible plastic sheet material such that the said flexible plastic sheets are spaced apart from each other to bound a continuous air chamber when the assembly is inflated, comprising

a first insulating outer section formed of a first pair of spaced transparent plastic sheets, said first pair of spaced plastic sheets joined together by a plurality of spacers of transparent plastic so as to form a multiplicity of separate sealed air pockets,

a second insulating outer section formed of a second pair of spaced transparent plastic sheets, said second pair of spaced plastic sheets joined together by a plurality of spacers of transparent plastic so as to form a multiplicity of separate sealed air pockets except as noted herein, said first and second insulating outer sections being each joined by flexible plastic spacers to opposed sides of a central heat collecting flexible plastic sheet which is of an opaque color, such as black, so as to absorb radiant solar heat; said spacers joined to the said central sheet being of different lengths located so as to form at least one continuous passage of consecutive air channels in an air chamber on each side of the central sheet,

said air chambers being joined so as to form one continuous passage for air which is fed into a first said air chamber from an inlet joined to said chamber and led from the second air chamber from an outlet connected thereto,

an adjustable constriction valve mounted to said outlet so as to create a controlled amount of back pressure in said first and second chambers so as to cause the said chambers to be inflated with a desired volume of air so as to space the central heat collector sheet from both outer insulating sections when air is pumped into the inlet of said first chamber by pump means, such that the air pumped into the device by the said pump means serves to inflate the structure while the air is heated by radiant energy absorbed by the central sheet, with said heated air then led from said outlet and serving to transfer heat from the central sheet to exterior exchange means.

4,203,426
SOLAR ENERGY CONVERTER CAROUSEL MOUNTED RACK

William C. Matlock, and Patricia Matlock, both of 510 S. 52nd St., #101, Tempe, Ariz. 85281

Filed Aug. 11, 1978, Ser. No. 933,097
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—425 5 Claims

1. An exchange means comprising:

a rack,

said rack being mounted on a substantially horizontal platform having an arcuate configuration,

said platform being positioned for rotatable movement through an arcuate path,

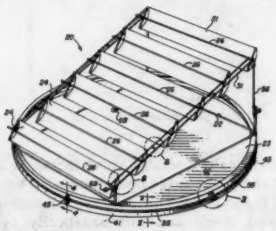
at least a pair of juxtapositioned reflectors mounted on said rack in a parallel arrangement,

each of said reflectors comprises a trough having a parabolic reflecting surface,

means for pivotally mounting each of said reflectors in a parallel arrangement on said rack,

a fluid bearing tube extending longitudinally of each of said reflectors on said rack and approximately disposed with the axis of a portion of said tube in the focal zone of an associated reflector.

a first electric means for moving said reflectors on said rack in unison through a similar arc partially around the portion of the tube associated with each of the reflectors for maintaining said reflectors with the axis of their curvature approximately in a plane containing the sun's center,



a second electric means mounted on said support for sensing the position of the sun for moving said platform to orient and maintain said rack and reflectors with their axes of curvature of their reflective surfaces approximately in a plane containing the sun's center.

said second electric means comprising an electric motor for driving said platform sequentially back and forth around an arcuate track,

said second electric means sensing the position of the sun and tracking the sun in an azimuth mode,

whereby the reflection of the sun's rays are concentrated by said reflectors in a line image along said portions of said tubes, and

means for selectively varying the angular position of said rack to said platform.

4,203,427
PORTABLE SOLAR/NON-SOLAR COOKER

Lee V. Way, Jr., Rte. 4, Box 185F, Sumter, S.C. 29150

Filed Dec. 26, 1978, Ser. No. 972,967
Int. Cl.[2] F24J 3/02; F24C 1/16; F28F 7/00
U.S. Cl. 126—451 4 Claims

1. A portable cooker adapted for utilizing both solar and non-solar sources of heat comprising:

(a) a housing including an internally insulated removable base member and structurally associated internally insulated front, rear and side wall portions defining an opening in the side of said housing opposite said base member;

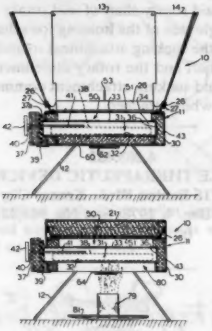
(b) a solar energy trapping shield member extending between said wall portions parallel to said base member and covering the opening defined thereby;

(c) an oven compartment formed with fixedly positioned heat conductive bottom and top walls parallel to said shield member, said oven compartment being enclosed within the lower portion of said housing and positioned to provide a heat trapping compartment below said shield member and above said top wall and having positionable door means providing access to said oven compartment through one side thereof;

(d) a light reflecting assembly removably positionable on the wall portions of said housing adjacent the edges of said shield member and adapted to direct solar radiation im-

pinging thereon to said shield member to heat said heat trapping and over compartments;

(e) securing means detachably securing said base member to said housing below said oven compartment enabling said base member in a first mode to be positioned below and to insulate said oven compartment bottom wall and in a



second mode to be positioned to expose a major portion of said oven compartment bottom wall accessible for being heated by an external source of heat applied thereto; and

(f) a cover detachably securable to said housing and adapted to cover said opening to reduce heat loss above said oven compartment when said light reflecting assembly is removed during utilization of said external source of heat.

4,203,428

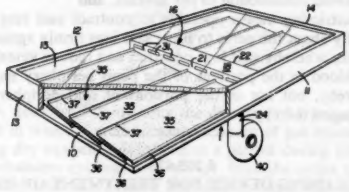
SOLAR HEATER

Joseph E. Fodor, 712 Shore Dr., Boynton Beach, Fla. 33435

Filed Jun. 29, 1978, Ser. No. 920,465

Int. Cl.[2] F24J 3/02

U.S. Cl. 126—449 **7 Claims**



1. In a solar heater having:

a housing with a top cover which passes solar radiation into the interior of the housing;

a plurality of inclined solar radiation-absorbing sheets of high heat conductivity material inside said housing which partially overlap each other in succession and are spaced apart to provide air passages between neighboring sheets;

and means for passing air from outside the housing through said air passages to be heated by said sheets and for withdrawing the heated air from the housing for utilization;

the improvement wherein:

said sheets have a thickness of not more than substantially 0.010 inch each where they overlap;

the spacing between neighboring sheets at said air passages where they overlap is not more than substantially 0.025 inch;

and said solar heater further comprising:

a plenum enclosure located centrally in said housing between a plurality of said partially overlapping sheets at one side and a plurality of said partially overlapping sheets at the opposite side;

means providing an air inlet leading into said plenum enclosure;

means providing an air outlet spaced from said inlet and leading from the interior of said plenum enclosure;

and an interior baffle in said plenum enclosure blocking said air inlet from said air outlet;

said plenum enclosure having openings on one side of said baffle leading into the space between said sheets on both sides of the plenum enclosure for passing air thereto from said air inlet.

4,203,429

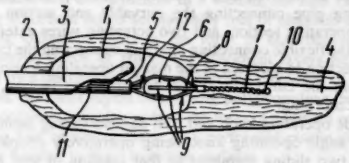
METHOD OF REMOVING CONCRETIONS FROM THE URETER

Petr N. Vasilevsky, bulvar Druzhby Narodov, 8, kv. 27; Jury G. Ediny, prospekt 40-letia Oktyabrya, 88, kv. 67, and Ivan V. Parfinenko, ulitsa Kochubeevskaya, 12, kv. 1, all of Kiev, U.S.S.R.

Filed Oct. 11, 1977, Ser. No. 840,762

Int. Cl.[2] A61B 19/00, 17/00

U.S. Cl. 128—1 R **1 Claim**



1. A method for removing concretions from the ureter with the use of a disintegrating instrument and an extractor having a holder with wire arms which form a stone-catching basket which is provided with a guiding rod having a rounded body attached to its end, said method comprising the steps of:

inserting said extractor with said wire arms and said guiding rod, having said rounded body attached to its end, into the ureter via the urethra and the bladder by means of a cystoscope until said wire arms contact the concretion;

capturing the concretion in said stone-catching basket by turning said wire arms with the purpose of enveloping the concretion;

passing the concretion from the ureter into the bladder by removing said extractor until said stone-catching basket with the concretion captured therein enters the bladder while letting said guiding rod of said wire arms remain in the ureter meatus;

inserting said disintegrating instrument into the bladder until one end of said instrument comes into contact with the concretion;

disintegrating the concretion in the bladder by means of said disintegrating instrument while the concretion is being held suspended by said wire arms;

withdrawing said disintegrating instrument from the bladder;

closing said stone-catching basket of said extractor by bringing said wire arms together;

inserting said closed stone-catching basket of said extractor into the ureter meatus;

opening said stone-catching basket by moving said wire arms apart;

inserting a catheter into the ureter to a position proximate the location where said concretion was previously captured;

withdrawing said extractor from the ureter and the bladder through said cystoscope;

withdrawing said cystoscope from the bladder and the urethra;

withdrawing said catheter from the ureter through the ure-

thra following the catherterization after the mucous membrane of he ureteral walls has healed; and

removing concretion fragments by flushing the bladder.

4,203,430

DEVICE FOR CONTROLLING CURVATURE OF AN END SECTION IN AN ENDOSCOPE

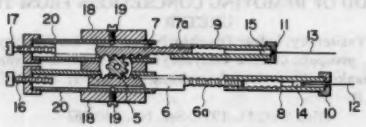
Nagashige Takahashi, Tokiwadai Green Haitsu 602, No. 28-10, Tokiwadai 3-chome, Itabashi-ku, Tokyo, Japan

Filed Oct. 28, 1977, Ser. No. 846,473

Claims priority, application Japan, Dec. 16, 1976, 51/168782

Int. Cl.[2] A61B *1/00*

U.S. Cl. 128—4 **3 Claims**



1. In an endoscope of the type having a curvable end section adapted to be inserted into a part to be examined, a flexible connecting pipe connecting the curvable end section to a manual operating section, and two actuating wires extending through the flexible connecting pipe and connecting the curvable end section to a device in the manual operating section for controlling the curvature of the curvable end section, said device comprising:

an angle operating knob and two parallel sliding members, said angle operating knob being operatively coupled to said two sliding members so that rotation of said angle operating knob produces movements of said two sliding members in opposite directions,

tension control members attaching said two wires to respective ones of said two sliding members, said tension control members being adjustable to regulate the tensions of said two wires, and

adjustment members provided in the movement ranges of said two sliding members and adjustable to define the maximum movement positions of said two sliding members.

4,203,431

FACIAL TREATMENT DEVICE

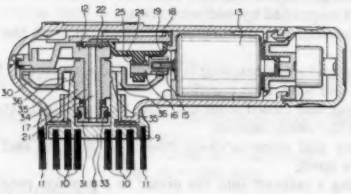
Yoshinori Aburs; Yuritugu Toyomi, and Motohisa Nishino, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 27, 1978, Ser. No. 900,797

Claims priority, application Japan, May 6, 1977, 52-52396

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—39 **12 Claims**



1. A facial treatment device in combination with detachable sucking and rotary attachments, said device comprising a housing, a rotary power source housed in said housing and including an output shaft, an air pumping means housed in the housing to be driven by said rotary power source, a stationary shaft disposed at right angles to said output shaft and forming an axial air-flow path communicated at one end with air-intake side of said pumping means and at the other end with the exterior of the housing, and a rotary member including a rotary shaft supported coaxially relative to said stationary shaft to be rotated thereabout by the rotary power source, an end of the stationary shaft on the side of said other end of the air-flow path projecting beyond said rotary shaft, said end of said stationary shaft and said rotary shaft of said rotary member being accessible on a single side of the housing for selectively mounting and detaching the sucking attachment to and from said end of the stationary shaft and the rotary attachment to and from said rotary shaft, said sucking attachment communicating with said air flow path when attached.

4,203,432

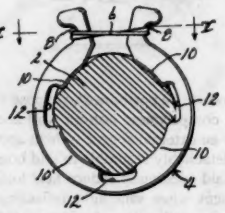
MALE THERAPEUTIC DEVICE

Edward G. Koch, 716 Benton Blvd., Kansas City, Mo. 64124

Filed Dec. 4, 1978, Ser. No. 965,831

Int. Cl.[2] A61F *5/00*

U.S. Cl. 128—79 **5 Claims**



1. A therapeutic device for assisting in the maintenance of erection in the male penis, and comprising:

a. a ring of flexible but relatively inelastic material adapted to encircle the base of the penis closely adjacent the body, and having angularly spaced apart, radially inwardly projecting lugs at the inner periphery thereof, said lugs alternating with recessed notches, one of said notches being disposable at the ventral side of the penis whereby to avoid constriction of the urethra, and

b. constricting means operable to contract said ring resiliently about the penis to press said lugs firmly against the penis, whereby said lugs constrict and reduce veinal flow of blood in the portions of the penis periphery engaged thereby, but not in the portions of said periphery not engaged thereby.

4,203,433

SPREADING DEVICE FOR TREATMENT OF HIP DYSPLASTIES

Gertraud Prahl, Rullstorf, Fed. Rep. of Germany, assignor to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,766

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806173

Int. Cl.[2] A61F *3/00*

U.S. Cl. 128—80 A **3 Claims**

1. A spreading device for the treatment of hip dysplasties, comprising

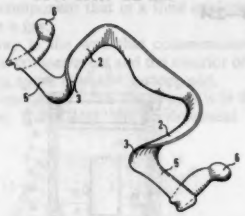
a back support portion for engagement with a patient's back in the area of the sacrum,

a pair of side portions extending forwardly from said back portion along opposite sides of the patient,

a pair of arch portions joined to the forward ends of said side portions, said arch portions extending forwardly and inwardly and arranged for engagement between the pelvis and thigh of the patient, and

a pair of thigh splint portions each resiliently flexibly connected to a forward end of one of said arch portions in the manner of a leaf spring, said thigh splints arranged for

engagement diagonally with inner sides of the thighs from an upper front portion to a lower rear portion of each thigh, leaving open and unobstructed the general area of the patient's perineum and rump,



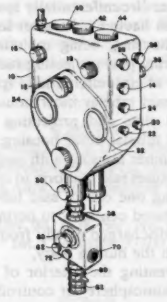
the lower end of each thigh splint including a generally dish-shaped support for engagement with a thigh of the patient at or above the ham.

4,203,434

TIMING ASSEMBLY FOR OXYGEN RESPIRATION UNITS

Lula M. Brooks, 5038 N. Kenmore, Chicago, Ill. 60640

Filed Apr. 5, 1978, Ser. No. 893,901
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—205.24 **8 Claims**



1. A device for controlling the duration of a pre-set timed period in which a predetermined amount of gas mixture containing dry oxygen is delivered to a patient during inhalation and exhalation cycling, respectively, from the outlet tube of a respirator unit to a patient, said device fitted with means to permit said predetermined amount of gas mixture containing dry oxygen to flow from the respirator unit during inhalation cycling and exhalation cycling, respectively, to the patient for said pre-set timed period, and upon termination of said pre-set timed period, said means acting to shut off the flow of said dry oxygen gas mixture to the patient and substitute a flow of air from the atmosphere to the patient at the conclusion of said pre-set timed period, comprising

a housing fitted with a first inlet tube with means on said inlet tube to detachably engage the outlet tube of a respirator in a sealed engagement, said housing fitted with a second inlet tube leading from a source of atmospheric air,

valve means in said housing, said first and second inlet tubes each joined in the housing to said valve means, an outlet tube in said housing, said valve means is also connected to said outlet tube of the housing, said outlet tube of the housing fitted with means to detachably join a tube that may be employed to connect to a face mask secured to a patient for supply of the dry oxygen gas mixture from the respirator unit,

said valve means being moveable from a first position in which the housing outlet tube is connected only to the first inlet tube, to a second position in which the housing outlet tube is connected only to the second inlet tube, with a timer device mounted to said housing means to manually actuate said timer device and initiate said pre-set timed period, said timer device is fitted with means to cause the valve to move from the said first position to the said second position, at the conclusion of said pre-set timed period of time after the timer device has been manually actuated.

4,203,435

WOUND DRESSING

Manfred Krull, Heiligkreutzsteinach; Holger Buchwald, Hemsbach, and Wilhelm Kirsch, Birkenau, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,308
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 7703897[U]
Int. Cl.[2] A61L *15/00*
U.S. Cl. 128—156 **1 Claim**

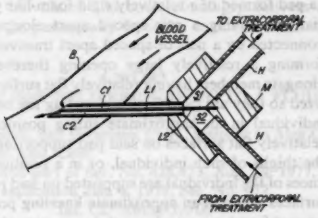
1. A wound dressing comprising at least five layers needled together into an integral structure, the two outer layers being permeable and non-adherent to a wound, the next two layers being absorbent layers substantially free of channels and comprising cellulosic fibers in the form of absorbent cotton, a nonwoven fleece or fabric, the absorbent layers being separated by a distribution layer comprising a powder of modified starch, the outer layers comprising polypropylene, polyethylene, polyester or polyamide in the form of a fibrous nonwoven fleece, knit or woven fabric or a perforated plastic sheet thermally bonded to form fuzz-free surfaces.

4,203,436

ASSEMBLY FOR DIVIDING A HOLLOW HYPODERMIC NEEDLE INTO TWO SEPARATED FLOW CONDUITS

Lars Grimsrud, P.O. Box 1379, Salmon, Id. 83467

Filed Mar. 28, 1978, Ser. No. 891,045
Claims priority, application Norway, Apr. 5, 1977, 771208
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **3 Claims**



1. Assembly for dividing a hollow hypodermic needle into two separated flow conduits and connecting said conduits with associated pipe coupling means for, respectively, discharge of blood for extracorporal treatment from a blood vessel punctured by the needle and returning said blood to the punctured vessel, said assembly comprising an elongated tongue member having a first portion dimensioned for insertion into the inner cavity of the needle in sealing contact with the cavity wall and a second portion wider than the first portion and designed to protrude from the rear end of the hypodermic needle when the first portion is inserted in said inner cavity, a pair of pipe stubs for hose connection and shaped for sealing bearing against opposite sides of the protruding second portion of the elongated tongue member and the rear end of the needle in order to provide flow communication for each pipe stub with an indi-

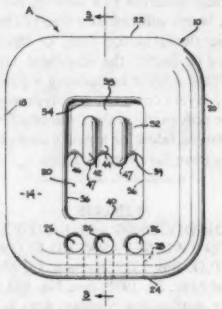
vidually associated one of the two separated flow conduits formed by said insertion of the first portion of the tongue member into the inner cavity of the needle, the second portion of the tongue member, said pipe stubs and the rear end of the needle being at least in part embedded in a curable mass after the insertion of the first portion of the tongue member into the inner cavity of the needle and mounting the pipe stubs in sealing bearing against the second portion of the tongue member and the rear end of the needle.

4,203,437

APPARATUS AND METHOD FOR ALLEVIATING PHYSIOLOGICAL CONDITIONS BY DIRECTED SPRAY OF LIQUID TOWARD BODY TISSUE

Matlock M. Mims, Pacific Palisades, Calif., assignor to Gregory Bernard Bergeron, Los Angeles and Robert James Heiner, Play Del Rey, both of, Calif.

Filed Mar. 10, 1978, Ser. No. 885,124
Int. Cl.² A61M *3/00*
U.S. Cl. 128—229 **52 Claims**



1. A therapeutic spray device for treating groin and anal areas of human beings to relieve at least prostate or vaginal or anal ailments and conditions thereof, said device comprising:

(a) a pad formed of a relatively rigid foam-like plastic material and having a pair spaced apart elongate members connected by a pair of spaced apart transverse members forming a relatively large opening therebetween, said elongate members having relatively flat surfaces and being sized so they are capable of supporting the buttocks of an individual in an approximate sitting position with said relatively flat surfaces on said pad supporting portions of the thighs of such individual, or in a position where the knees of the individual are supported on said relatively flat surfaces when in an approximate kneeling position,

(b) means forming a nozzle receiving aperture in one of said transverse members of said pad and which is spaced fowardly of said opening,

(c) a nozzle capable of being disposed in said aperture and capable of being connected to a source of liquid under pressure, said nozzle having at least one aperture located to be directed toward the groin and anal areas of a person sitting or kneeling on said pad, said nozzle being located relative to a person disposed on said pad so that it is not readily adaptable for insertion in a body cavity and is capable of emitting a spray of said liquid toward said anal or groin areas to treat or alleviate at least prostrate or vaginal or anal aliments and with the waste liquid passing through said opening, and

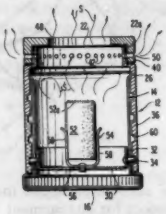
(d) connection means on said nozzle for connection to a source of liquid under pressure.

4,203,438

MOXA BURNER AND MOUNT FOR MULTIPLE MOXA BURNERS

Desmond K. Shiu, 660 Elm St., Montpelier, Vt. 05602

Filed Feb. 8, 1979, Ser. No. 10,346
Int. Cl.² A61F *7/00*
U.S. Cl. 128—254 **4 Claims**



1. A moxa burner for applying the smoke and heat generated by burning of a moxa roll to a limited surface area of the human body about an acupuncture point or the like, said moxa burner comprising:

a tubular outer housing bearing spiral grooves on the inner wall thereof,

a tubular inner housing having a diameter slightly less than the diameter of said tubular outer housing and concentrically mounted therein,

a plurality of parallel, longitudinal slots within said tubular inner housing, at circumferentially spaced positions,

a circular platform having a diameter less than that of said tubular inner housing, being mounted coaxially therewithin and bearing pins projecting radially from the platform periphery at circumferentially spaced positions corresponding to said tubular inner housing slots, being received by said slots and projecting within said spiral grooves of said tubular outer housing; whereby, rotation of said tubular inner housing with respect to said tubular outer housing causes said platform to move longitudinally,

a closure overlying one end of said tubular outer housing and being apertured centrally to permit the moxa smoke and heat to be discharged axially from said moxa burner for contact with the human body,

vent means for venting the interior of said tubular inner housing to the atmosphere for controlling burning of the moxa roll, and

means for mounting said moxa roll on said platform facing said cover and movable with said platform towards and away from said opening within said cover.

4,203,439

OSMOTIC SYSTEM WITH VOLUME AMPLIFIER FOR INCREASING AMOUNT OF AGENT DELIVERED THEREFROM

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 743,974, Nov. 22, 1976, abandoned. This application Oct. 11, 1978, Ser. No. 950,515
Int. Cl.² A61M *31/00*
U.S. Cl. 128—260 **15 Claims**

1. An osmotic system for the controlled delivery of a beneficial agent to an environment of use, said system consisting essentially of:

(a) a shaped wall permeable to the passage of an external fluid present in the environment of use and substantially impermeable to the passage of agent, the wall surrounding and forming;

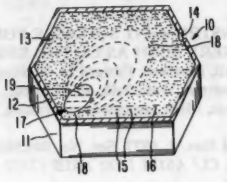
(b) a compartment having a single internal space;

(c) an agent formulation in the compartment that exhibits an osmotic pressure gradient across the wall against the external fluid;

(d) a volume amplifier in the compartment for increasing the amount of agent delivered from the compartment, said amplifier consisting essentially of an expandable semipermeable membrane surrounding a gas generating couple, said couple consisting essentially of an acidic component and a basic component that in a fluid environment react and generate a gas;

(e) a passageway in the wall that communicates with the interior of the compartment and the exterior of the system for delivering agent from the system; and,

(f) wherein in operation, when the system is in the environment of use, fluid from the environment is imbibed



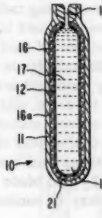
through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, which fluid (1) forms a composition containing agent formulation, and (2) activates the amplifier to imbibe fluid from within the compartment, said fluid wetting the couple in the amplifier causing it to react, generate gas and increase the volume of the amplifier, urging it to expand and continuously fill the compartment, whereby through the combined action of (1) and (2) agent is delivered through the passageway from the system at a controlled rate over a prolonged period of time.

4,203,440

DEVICE HAVING VARIABLE VOLUME CHAMBER FOR DISPENSING USEFUL AGENT

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Oct. 23, 1978, Ser. No. 953,489
Int. Cl.² A61M *31/00*
U.S. Cl. 128—260 **17 Claims**



1. A device for delivering a useful agent to an environment of use, comprising:

(a) a useful agent;

(b) a housing having a shape retaining wall defining an internal space, the housing having at least one opening connecting the space with the exterior of the device;

(c) a variable volume chamber in the housing, said chamber comprising a flexible wall surrounding a reservoir for storing the agent, and a passageway for delivering the agent from the chamber to the exterior of the device;

(d) a pressure generating member in the housing positioned between the housing and the chamber, said member formed of a semipermeable polymer having therein a swellable, insoluble hydrophilic polymer; and,

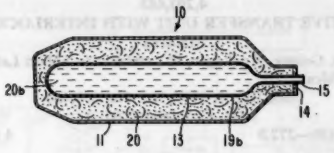
(e) wherein, in operation when the device is in the environment of use, the member imbibes fluid admitted into the device, causing the member to expand, generate and exert pressure on the chamber which decreases the volume of the chamber thereby delivering agent through the passageway from the device at a controlled rate over a prolonged period of time.

4,203,441

OSMOTICALLY TRIGGERED DEVICE WITH GAS GENERATING MEANS

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Dec. 18, 1978, Ser. No. 970,537
Int. Cl.² A61M *31/00*
U.S. Cl. 128—260 **15 Claims**



1. A device for delivering a useful agent to an environment of use, comprising:

(a) a useful agent;

(b) a housing comprising a shape-retaining wall formed of a semipermeable polymer that defines an internal space and has an opening that connects the space with the exterior of the device;

(c) a container in the housing, said container comprising a flexible wall surrounding a reservoir for storing the agent, and a passageway that passes through the opening for delivering the agent from the container to the exterior of the device; and,

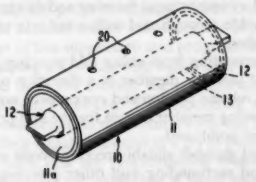
(d) means for generating a gas in the device interposed between the housing and the container, said means generating gas in response to fluid admitted into the device, which gas exerts pressure on the container causing it to decrease in volume and correspondingly delivers agent through the passageway from the device in a unit time.

4,203,442

DEVICE FOR DELIVERING DRUG TO A FLUID ENVIRONMENT

Alan S. Michaels, San Francisco, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 828,473, Aug. 29, 1977. This application Jan. 4, 1979, Ser. No. 972
Int. Cl.² A61M *31/00*
U.S. Cl. 128—260 **7 Claims**



1. A drug delivery device comprising:

(a) a drug;

(b) a housing having a shape-retaining wall defining an internal space;

(c) a multiplicity of holes in the housing for admitting exterior fluid into the device;

(d) a container in the housing, said container formed with a collapsible wall surrounding a reservoir for storing the drug and a passageway that extends through the housing for delivering drug from the container to the exterior of the device; and,

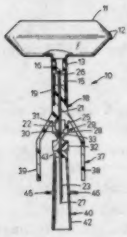
(e) a laminate in the housing surrounding the container comprising a lamina of an absorbent material and a lamina of a swellable hydrophilic polymer, said laminate capable of imbibing fluid through the holes into the housing, thereby causing the laminate to expand and exert pressure on the container which collapses said container and concomitantly pumps drug through the passageway form the device at a controlled rate over a prolonged period of time.

4,203,443

ADDITIVE TRANSFER UNIT WITH INTERLOCKING MEANS

Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Filed Dec. 8, 1977, Ser. No. 858,495
Int. Cl.[2] A61J *1/00*
U.S. Cl. 128—272.3 **4 Claims**



1. An additive transfer device for storing and transferring of a medicament to a solution container having a pierceable closure comprising:

an additive container for storing the medicament to be transferred, said container having a tubular neck portion defining a flow path into said container;

a pierceable sealing element positioned in sealing engagement with the passageway in the additive container;

a piercing guide member having a projecting tubular portion adapted to be seated in said tubular neck portion;

a guide passageway extending through said guide member;

a piercing member having a channel therethrough for the flow of said medicament and a piercing point on both ends thereof, a portion of said piercing member in slidable contact with said guide passageway;

interlocking means operatively associated with said piercing guide member and said piercing member, said interlocking means defined by expandable finger portions providing an orifice and a compartment member and an annular projection receivable through said orifice and into said compartment member;

wall means extending from either said piercing guide member or said piercing member in a direction opposite said projecting tubular portion and coextensive with a portion of said piercing member except for the end portion defining said one point; and

a needle guard member slidably received over said piercing member and surrounding said other piercing point with said annular projection including a contact member and carried by said piercing member and said expandable finger portions and compartment carried by said piercing guide, said needle guard member contacting said contact member opposite said orifice;

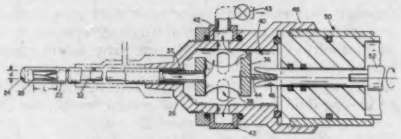
said interlocking means constructed and arranged in conjunction with said piercing member so that with said projecting tubular portion seated in said tubular neck portion one of said piercing points will be spaced from said pierceable sealing element, so that upon movement of said piercing member in said guide passageway and upon engagement of said interlocking means said one of said piercing points will puncture said pierceable sealing element and upon entry of the other piercing points through said closure of said solution container a pathway between the containers is provided and the medicament will flow into the solution container.

4,203,444

SURGICAL INSTRUMENT SUITABLE FOR CLOSED SURGERY SUCH AS OF THE KNEE

Leonard J. Bonnell, Medford; Edward H. McHugh, Southboro; Douglas D. Sjostrom, Wakefield, all of Mass., and Lanny L. Johnson, Okemos, Mich., assignors to Dyonics, Inc., Woburn, Mass.

Filed Nov. 7, 1977, Ser. No. 848,982
Int. Cl.[2] A61M *1/00*; A61B *17/32*
U.S. Cl. 128—276 **55 Claims**



1. A surgical instrument for a joint space of the body characterized in that the instrument comprises an intra-articular shaver comprising an external stationary tube sized for insertion into said joint space, said external tube having a closed distal end and defining a side-facing, axially extending shaving port on the periphery only of said external tube and an internal member with close running fit with said external tube, defining an internal, rotary blade at said shaving port, said blade during each cycle constructed to open said port to the interior of the instrument and said blade having an axially extending edge adapted to co-act in shearing action with a cooperative axial edge defined by said external tube at said port to produce a succession of discrete shavings with progressive revolutions of said blade, said internal member having radial bearing portions at both proximal and distal ends of said blade, rotatably supported by corresponding portions of said external tube and effective to maintain said blade and edge in shearing relation, a vacuum conduit for drawing fluid and articles to be shaved into said shaving port and to draw said discrete shavings through the instrument, and a drive motor adapted to rotate said blade at a shearing speed of the order of 200 rpm or below that enables degenerated cartilage and synovial tissue of the joint to enter and be severed by said blade into discrete shavings for being transported away in succession through said vacuum conduit.

4,203,445

GAS-VENTING FILTER ASSEMBLY FOR COLLECTION DEVICE

James L. Jessup, Elk Grove Village, and Eugene W. Elliott, Barrington, both of Ill., assignors to Hollister Incorporated, Chicago, Ill.

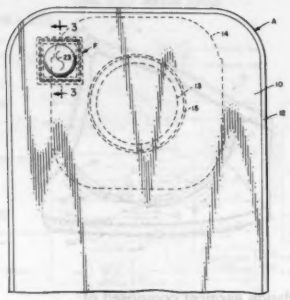
Filed Dec. 11, 1978, Ser. No. 968,445
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—283 **14 Claims**

1. In combination with a collection appliance formed of fluid and odor impermeable thermoplastic sheet material, said appliance including panels defining an enclosure and having an opening therein for receiving body discharge, and attachment means for forming a temporary seal about said opening so that

body discharge passes into said enclosure, a gas-venting filter assembly comprising:

(a) a recess provided in one of said panels, the portion of said one panel providing said recess being displaced outwardly from the plane of said one panel;

(b) a generally planar filter unit bridging said recess with its peripheral portion sealed to said one panel around said recess; and



(c) gas outlet aperture means formed in said outwardly displaced panel portion, said aperture means being of sufficient size so as to be essentially non-flow restricting with respect to the vented gas, and said outwardly displaced panel portion in which said gas outlet aperture means is formed being normally spaced from said filter unit.

4,203,446

PRECISION SPRING LANCET

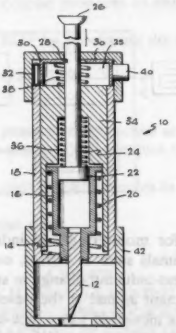
Wilhelm A. Höfert, Kollnau; Peter F. Schlüssel, Freiburg; Anton H. Sutor, Freiburg, and Georg J. Ullrich, Freiburg, all of Fed. Rep. of Germany, assignors to Hellige GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,711

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642896

Int. Cl.² A61B 17/34

U.S. Cl. 128—329 R **8 Claims**



1. An improved lancet holder for the creation of standard puncture wounds in the skin for diagnostic purposes of the type having a housing, a lancet mounted for motion in the housing, means for urging the lancet into contact with the skin, a trigger for activating the urging means, and means for withdrawing the lancet from the skin after contact therewith, wherein the improvement comprises:

means for preventing recoil of the lancet holder in response to the activation of the urging means wherein the recoil preventing means includes a mass mounted for motion in the housing in opposition to the motion of the lancet upon activation by the trigger.

4,203,447

SECURITY MAINTENANCE FOR PROGRAMMABLE PACER REPROGRAMMING

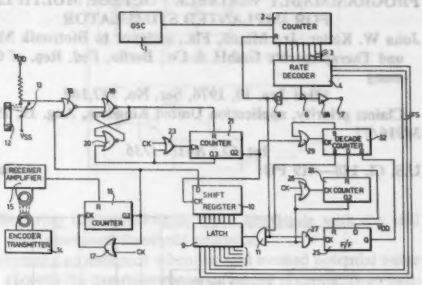
John W. Keller, Jr., Miami, Fla.; Dennis Digby, Brooklyn Park, and Alan Coombes, New Hope, both of Minn., assignors to Biotronik Mess- und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 917,130

Claims priority, application United Kingdom, Aug. 19, 1977, 34911/77

Int. Cl.² A61N 1/36

U.S. Cl. 128—419 PG **13 Claims**



1. A programmable, implantable body function control apparatus comprising: control means for influencing a function of the body by providing a train of stimulation pulses in accordance with a selected program, said control means including means for changing the selected program in order to vary at least one parameter of the stimulation pulses; program storage means for storing a predetermined number of bits representing the currently selected program and connected to said means for changing for supplying the currently selected program to said control means; program detection means connected to receive and temporarily store a predetermined number of bits representing a newly selected program, said detection means including output means connected to said program storage means for supplying the bits received by said detection means; signal conduction means connected to receive bit signals provided by a source outside the body and to supply a corresponding sequence of bits, representing such newly selected program, to said program detection means in a pattern independent of that of the train of stimulation pulses being provided by said control means; and program change enable means connected to said program storage means for supplying a program change signal which causes the bits temporarily stored in said detection means to be transferred into said program storage means to replace the bits previously stored in said program storage means, said program change enable means being composed of: first counter means connected for providing a count of the number of bits supplied to said program detection means, and for supplying a first enabling signal only when its count is equal to, and does not exceed, the predetermined number of bits; timer means connected for responding to the first bit supplied to said program detection means and for supplying a second enabling signal at the end of a given period of time after response to such first bit; synchronizing means connected to said control means for supplying a third enabling signal in synchronism with each stimulation pulse provided by said control means; and gating means connected to said counter means, said timer means and said synchronizing means for supplying such program change signal to said program storage means only when said first, second and third enabling signals

are present in time coincidence, whereby the bits temporarily stored in said program detection means can be transferred into said program storage means only when precisely the predetermined number of bits has been supplied to said program detection means within the given period of time and at a point in time which is in synchronism with a stimulation pulse provided by said control means.

4,203,448

PROGRAMMABLY VARIABLE VOLTAGE MULTIPLIER FOR IMPLANTED STIMULATOR

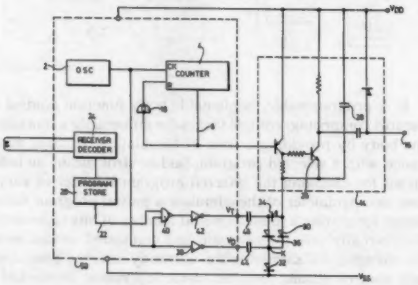
John W. Keller, Jr., Miami, Fla., assignor to Biotronik Mess- und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 917,140

Claims priority, application United Kingdom, Aug. 19, 1977, 34916/77

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **3 Claims**



1. In a programmable pacer system having a remote source of program control signals, an implantable pacer comprising:

(a) a voltage supply;

(b) oscillator means for producing a pulse signal having a fixed frequency;

(c) counter means for generating a pacer output control signal upon each occurrence of a predetermined plurality of oscillator pulses;

(d) memory means for receiving from said source and for storing a program control signal representative of a desired multiplication factor of said supply voltage for pacer stimulation signals;

(e) output means, responsive to said output control signal, for generating pacer stimulation signals, said output means including:

(i) a first capacitor coupled on one side to said supply, and

(ii) transistor means, connected in parallel with said capacitor and enabled by said output control signal, for generating stimulation signals having an amplitude of the voltage on said capacitor at the time of occurrence of said control signal;

(f) capacitor means, enabled by said stored program control signal, and charged by a plurality of successive excursions in one direction of said oscillator pulse signal, for supplying added charge increments to the other side of said first capacitor during successive excursions in the opposite direction of said oscillator pulse signal.

4,203,449

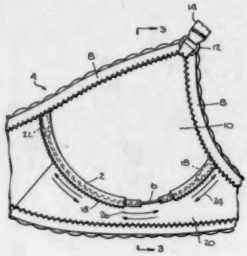
STRETCHABLE UNDERWIRE CASING FOR BREAST POCKETS

Leo L. Winzelberg, Hamden, Conn., assignor to The Strouse, Adler Company, New Haven, Conn.

Filed May 1, 1978, Ser. No. 901,508

Int. Cl.[2] A41C *1/14*

U.S. Cl. 128—473 **12 Claims**



1. A foundation garment comprised of:

(a) breast pockets formed of stretchable elastic material;

(b) an underwire casing formed of stretchable elastic material;

(c) a stretchable elastic frame member adjacent the underwire casing;

(d) zig-zag stitching securing the casing to the breast pockets and stretchable frame member; and

(e) an underwire slidably arranged within the underwire casing.

4,203,450

APPARATUS FOR MONITORING AND INDICATING THE ONSET OF PARTURITION

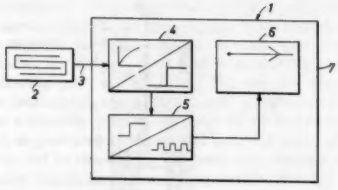
Werner Kegel, 4543 Lienen Hoeste 45, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,245

Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719698

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—630 **10 Claims**



1. Apparatus for monitoring and indicating the onset of parturition in animals such as horses, comprising means responsive to a sweat-inducing change in state occurring in the body of an expectant animal at the onset of parturition, said means including a measured value pick-up detecting element for contact with the skin or coat of the animal which produces a signal depending on sweat humidity secreted by the animal, signal transmitting means comprising a limiting value transmission means coupled to the detecting element to receive said signal therefrom, and a code signal generating transmitter controlled by said limiting value transmission means for producing a transmitted coded signal indicative of onset of parturition, and a parturition indicator including signal receiving means tuned to the code signal generating transmitter and

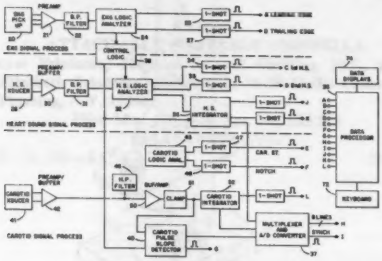
means controlled by the signal receiving means for providing a warning of the onset of parturition.

4,203,451

CARDIOVASCULAR ANALYSIS, METHOD AND APPARATUS

Joseph J. Panico, 8 Farrington St., Arlington, Mass. 02174

Filed Mar. 17, 1978, Ser. No. 887,505
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—672 **9 Claims**



1. A method of obtaining LVEDP (left ventricular end diastolic pressure) in a mammalian body comprising:

(a) measuring diastolic and systolic pressures;

(b) detecting the start of the electrocardiograph QRS complex;

(c) detecting the start of the first carotid pulse after the start of said QRS complex;

(d) detecting the start of the first heart sound after the start of said QRS complex;

(e) determining the carotid pulse slope by:

(1) sensing the carotid artery pressure by a transducer secured against the neck;

(2) converting the pressure variations sensed to electrical voltage signals;

(3) amplifying said voltage signals;

(4) adjusting the amount of said amplifying to calibrate the swing of said voltage signals to a predetermined level;

(5) processing said signals as amplified to obtain carotid pulse slope time by the time it takes said voltage signals to pass between two fixed reference levels;

(6) processing said carotid pulse slope time with said diastolic and systolic pressures to obtain carotid pulse slope; and,

(f) calculating LVEDP by processing the equation:

$$LVEDP = DIA - (73 - T2)CS$$

Where:

DIA = diastolic pressure at a brachial artery

T3 = Time from start of QRS complex to start of carotid pulse

T2 = Time from start of QRS complex to start of first heart sound

CS = Carotid pulse slope.

4,203,452

EFFICIENCY OF HUMAN LEARNING EMPLOYING THE ELECTROENCEPHALOGRAPH AND A LONG-TERM LEARNING DIAGNOSTIC-REMEDIAL PROCESS

David B. Cohen, 704 W. McMinn Ave., Dade City, Fla. 33525

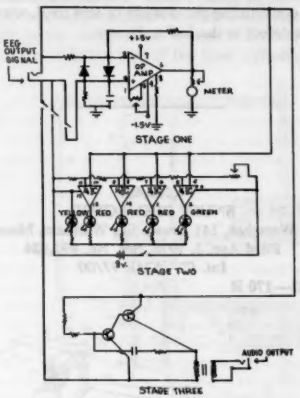
Filed Aug. 10, 1977, Ser. No. 823,431
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—732 **2 Claims**

1. A method for distinguishing between short-term and long-term learning in a human subject to thereby improve the efficiency of learning in the said human subject, comprising:

pre-determining a threshold value of potential for comparison with the individual's evoked potential representative of the brain wave pattern of a human subject,

presenting educational material as a stimulus for learning by the subject,

sensing the amplitude of the brain wave potential evoked from the subject by said learning stimulus,



comparing the sensed brain wave amplitude with the said pre-determined threshold potential,

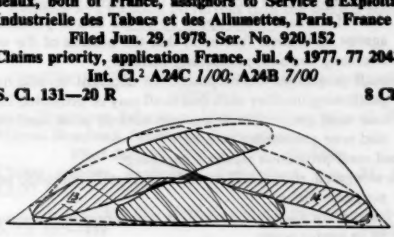
activating an indicator when the said evoked potential value exceeds the pre-determined threshold potential as an indication of the duration in which long-term learning is occurring.

4,203,453

PROCESS FOR THE REPETITIVE AND OPTIMALIZED LAYOUT OF SHAPES HAVING THE DETERMINED CONTOUR OF A CIGAR WRAPPER WITHIN EACH OF THE ELEMENTS OF A SERIES OF TOBACCO LEAVES

Jean-Francois Leclerc, Orleans, and Pierre Waegaert, Bordeaux, both of France, assignors to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Filed Jun. 29, 1978, Ser. No. 920,152
Claims priority, application France, Jul. 4, 1977, 77 20437
Int. Cl.[2] A24C 1/00; A24B 7/00
U.S. Cl. 131—20 R **8 Claims**



1. A process for the repetitive and optimalised layout of shapes having the determined contour of a cigar wrapper within each of the elements of a series of tobacco leaves or half-leaves (having an irregular shape and defects), with a view to cutting out and removing from said elements wrappers having said shapes, in which process at least one sample leaf is determined having dimensional characteristics inferior to those of the whole section of the series of the leaves to be cut out, then, for each of the sample leaves, cut out pattern cards are drawn up, each comprising the outline of a possibility, distinct from the others, of cutting a leaf similar to the sample leaf into said shapes of determined contour, wherein said pattern cards relating to the same sample leaf are graded into groups, as a function of their decreasing yield of wrappers, the pattern cards within the same group are graded as a function of at least

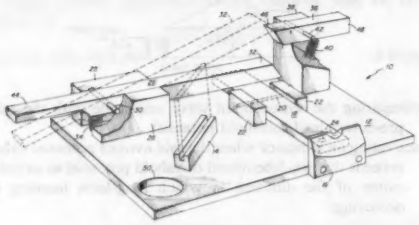
one criterion other than that of yield and relative to the interest of use presented by said pattern cards, there are superposed in turn, on each of the leaves to be cut out having dimensional characteristics at least equal to those of a sample leaf, the pattern cards corresponding to this latter sample leaf in the above order of grading, and the first pattern card is retained as cut out pattern for each leaf, on which the outlined shapes of wrappers, constituting the domain of said card, are not superposed on a defect in the leaf to be cut.

4,203,454

SNUFF PROJECTOR

Johann H. Wutscher, 141 Brown St., Waltham, Mass. 02154

Filed Apr. 3, 1978, Ser. No. 892,624
Int. Cl.[2] A24F *47/00*
U.S. Cl. 131—170 R **5 Claims**



1. A device for the projection of snuff into the nostrils of a user comprising:

a base;

a nose positioning member secured to the front edge of said base;

said nose positioning member being a vertical member whose upper edge is contoured to fit under the base of the nose of the user when upper lip of the user is positioned against its vertical face such that the nostrils of the user overhang the nose positioning member;

a snuff projection means positioned adjacent to said nose positioning member such that snuff may be projected from said snuff projection means into nostrils positioned over said nose positioning member;

said snuff projection means comprising:

an elongated, rearwardly extending, pivotally mounted snuff projection lever;

a fulcrum for said snuff projection lever positioned rearward of its center point;

pivot blocks mounted on said base to support said fulcrum;

the forward edge of said snuff projection lever normally sloping downward toward and almost abutting said vertical nose positioning member;

a pair of spaced apart depressions near the forward edge of said snuff projection lever;

each of said depressions of a size sufficient to hold a pinch of snuff and spaced to be located under nostrils overhanging said nose positioning member;

striking means to cause said snuff projection means to project snuff upward into the nostrils of the user;

restraining means to restrain said striking means when said striking means is in a spring loaded pre-striking position;

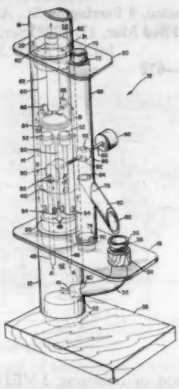
means to release said striking means to strike said projection means resulting in the projection of snuff into the nostrils of the user.

4,203,455

LIQUID-COOLED SMOKING DEVICE

Erwin S. Byrd, Jr., 1202 Livingston St., Wheaton, Md. 20902

Filed Sep. 13, 1978, Ser. No. 942,127
Int. Cl.[2] A24F *1/30*
U.S. Cl. 131—173 **13 Claims**



1. A liquid-cooled smoking device comprising:

housing means for defining at least two, vertically superposed chambers;

means for containing a supply of tobacco to be smoked;

means interconnecting said tobacco container and a first upstream one of at least two chambers for introducing smoke into said first chambers;

a second downstream chamber having a liquid coolant disposed therein;

means fluidically connected with said second chamber for withdrawing said smoke from said device;

means sealingly separating said first and second chambers; and

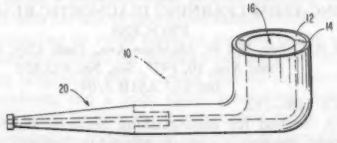
means within said second chamber for defining a sinusoidal liquid-cooling smoke flow path, said sinusoidal means including at least one pair of concentric tubes, the inner one of said concentric tubes having at least one aperture in its wall, said inner tube aperture facing the central axis of said second chamber and positioned at an elevational level above the surface of said coolant, the outer one of said concentric tubes having at least one aperture in its wall, said outer tube aperture positioned at an elevational level below the surface of said coolant, said separating means and said sinusoidal means acting together to permit said smoke to travel from said first chamber to said second chamber by said flow path and to prevent said coolant from entering said first chamber.

4,203,456

SMOKING PIPE

Richard T. Miller, Cedar La., Ossining, N.Y. 10562

Filed Aug. 26, 1977, Ser. No. 828,222
Int. Cl.[2] A24F *1/32*
U.S. Cl. 131—230 **15 Claims**



1. An article of manufacture being a smoking pipe having a

bowl for holding tobacco, said bowl being comprised of a lightweight concrete hardened from a mixture of Portland cement and water and at least one aggregate material selected from the group consisting essentially of perlite, pumice, molecular sieve materials, and mixed oxides of calcium, silicon and aluminum, where the ratio of said aggregate to said Portland cement is in the range of about 3/1 to about 8/1 by volume, said concrete having a density in the range of about 40-80 lbs./ft.^{3}, where the pore size of the hardened water and Portland cement mixture is substantially the same as the pore size of said aggregate.

4,203,457

ATTACHABLE PORTABLE UMBRELLA

Meyer Friedman, deceased, late of Flushing, N.Y., and by Elizabeth Friedman, administrix, 56-59 Hollis Court Blvd., Flushing, N.Y. 11365

Filed Mar. 13, 1978, Ser. No. 885,811
Int. Cl.^{2} A45B *11/02*
U.S. Cl. 135—5 C **5 Claims**

1. A collapsible umbrella which is detachably mounted to a garment of a wearer so as to be supported, in use, in the opened position of the umbrella above the head of the wearer, comprising

an umbrella assembly formed of ribs radially fastened at a first end of each rib to a top section of a post,

a tubular handle section telescopically slidably mounted about said post,

means joining said handle section and said ribs so as to cause said ribs to extend away from said post when the handle is moved to a first position towards the top section of said post and to draw towards said post in a collapsed position of the umbrella when the handle section is moved to a second position away from the top section of the post,

a flexible covering externally fastened to said ribs,

two compression members, each pivotally mounted to a second end of each of two ribs, and

two flexible tension members, each fastened to a second end of each of two other ribs, together with

means to detachably fasten the said compression members to a garment, together with

a pair of first brackets each adaptable for mounting externally on the shoulder section of a coat and each fitted with means for detachable fastening to one of the compression members.

4,203,458

NEGATIVE GRAVITY SWIVEL DEVICE

Alfred J. Barrett, Littleton, and Samuel M. Warner, Aurora, both of Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 5, 1978, Ser. No. 939,753
Int. Cl.^{2} F16K *17/36*
U.S. Cl. 137—38 **4 Claims**

1. A fluid gathering apparatus operable in either a positive or negative "g" environment, comprising:

(a) an outer cylinder;

(b) an inner cylinder substantially coaxial with the outer cylinder, attached at one end to the inner surface of the outer cylinder by a flange therebetween;

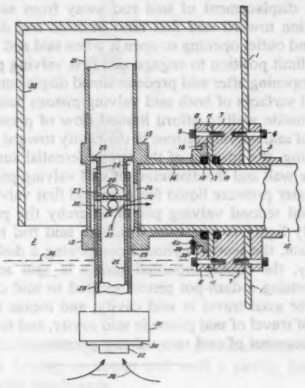
(c) an upper port in the wall of the inner cylinder;

(d) a lower port in the wall of the inner cylinder;

(e) a baffle plate inside the inner cylinder separating the segments of the cylinder containing the upper and lower ports;

(f) a coaxial intermediate cylinder slidably mounted between the inner and outer cylinders to form a seal therebetween;

(g) a port in the intermediate cylinder, located so that it aligns with the lower port of the inner cylinder when the slidable intermediate cylinder is in a first position, and aligns itself with the upper port of the inner cylinder when the slidable intermediate cylinder is in a second position;



(h) an opening through the walls of the outer cylinder communicating with the port in the intermediate cylinder, irrespective of whether the intermediate cylinder is in its first or second positions;

(i) a means for limiting the downward travel of the intermediate cylinder to a location no further than the first position; and

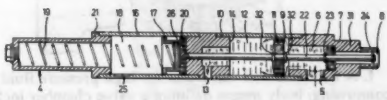
(j) a means for limiting the upward travel of the intermediate cylinder to a location no further than the second position.

4,203,459

CONTROLLING MECHANISM FOR SPRINKLER SYSTEM

Marcel Boschung, Schmitten, Switzerland, assignor to Firma Marcel Boschung, Schmitten, Switzerland

Filed Jan. 20, 1978, Ser. No. 870,946
Claims priority, application Switzerland, Jan. 27, 1977, 1013/77
Int. Cl.^{2} F16K *11/10, 31/36*
U.S. Cl. 137—119 **9 Claims**



1. In a sprinkler system a mechanism for controlling the passage of predetermined quantities of pressure liquid from a supply comprising a body having a first cylinder and a second cylinder joined coaxially together, a common piston rod running through both cylinders in the axial direction thereof, said piston rod having a piston in each cylinder mounted rigidly on said rod for axial displacement in its associated cylinder with axial displacement of said rod between opposite first and second limit positions, and a second piston mounted on said rod in

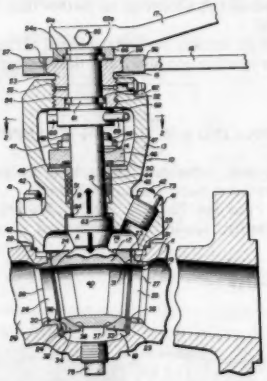
the first one of said cylinders, the pistons in said first cylinder being valving pistons, the first one of said cylinders comprising an inside wall defining at least one cavity having first and second outlet openings for liquid on opposite sides of the valving pistons, and one inlet opening between said outlet openings and connected to said supply, the first outlet opening being positioned to be engaged and closed by said rigidly-mounted valving piston when said rod is in said first limit position, and the second opening being positioned to be engaged and closed by said second valving piston when said rod is in said second limit position, the second valving piston engaging said second outlet opening to maintain it closed during a predetermined axial displacement of said rod away from said second limit position toward said first limit position and disengaging said second outlet opening to open it when said rod moves into said first limit position to engage said first valving piston with said first opening after said predetermined displacement, circumferential surfaces of both said valving pistons being spaced from said inside wall to afford limited flow of pressure liquid past one of said valving pistons in the cavity toward the open outlet opening, the spacing of the circumferential surfaces from the inside wall and the diameters of said valving pistons providing a greater pressure liquid force on said first valving piston than on said second valving piston whereby the pressure of said supply liquid in said inlet displaces said rod to its first limit position, the second cylinder comprising a dash pot having a cavity, the rigidly-mounted piston in said second cylinder comprising a dash-pot piston secured to said common piston rod for axial travel in said cavity, and means to regulate the rate of travel of said piston in said cavity, and thereby the axial displacement of said two valving pistons.

4,203,460

BALL VALVE WITH COMPOUND CLOSURE MOVEMENT

Werner K. Priese, Barrington, Ill., assignor to Hills-McCanna Company, Carpentersville, Ill.

Filed Mar. 15, 1978, Ser. No. 886,649
Int. Cl.[2] F16K *3/36*
U.S. Cl. 137—240 **10 Claims**



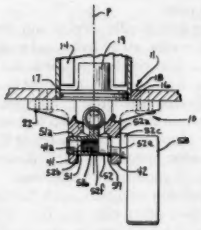
1. A flushable ball valve unit for high pressure fluid control comprising: body means defining a valve chamber including a pair of passages having respective openings communicating with said valve chamber and adapted for connection to a service line; seal support means comprising substantially flat annular surfaces about said passage openings into the valve chamber, said surfaces converging in a first direction; rotary ball means within said valve chamber including a through bore for connecting said passages when said ball means is in the valve open position; annular seal means disposed between said seal support means and said rotary ball means for establishing a fluid seal therebetween; port means formed in said body means providing a circulating system for flushing said chamber around said rotary ball means; means for rotating said rotary ball means between a valve open and a valve close position comprising stem means connected with said ball and supported by said body means for rotative movement; and operating means coupled to said stem means for moving said stem means and correspondingly said rotary ball means and said seal means in said first direction to a first, seated position, said seal means moving relative to said converging seal support surfaces with the converging nature of said surfaces forcing said seal means into firm sealing contact with said ball means and said surfaces, said operating means also being operable to move said stem means, ball means and seal means in a second direction opposite said first direction for movement of said ball to a second, unseated position thereby decreasing the sealing contact, such that movement from the seated position can be employed prior to rotative movement of the ball means thereby facilitating said rotative movement, with movement back to the fully seated position being effected once the desired rotative position of the ball means is attained; and said seal means being formed of a non-yieldable material, with said stem means being rigidly affixed to said ball means to preclude relative movement therebetween, such that when said ball means is in the valve closed, fully seated position, said ball means is precluded from movement axially with repect to said passages under the influence of high line pressure, thereby insuring the continuity of the sealing engagement and preventing line fluid from entering said chamber, such that flushing of said valve chamber can be accomplished without mixing the flushing medium and the fluid product in the service line.

4,203,461

FREEZER DOOR FOR A SOFT-SERVE FREEZER

Stephen W. Schwitters, Rockford, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Dec. 11, 1978, Ser. No. 967,961
Int. Cl.[2] F16K *31/60, 1/00, 31/44*; A23G *9/00*
U.S. Cl. 137—343 **5 Claims**



1. In a freezer door for a soft-serve freezer including a valve cylinder in the door having a product inlet and a product outlet, a valve member slidable in the valve cylinder to control flow from the product inlet to the product outlet, means on the door providing a pair of actuator supports spaced from relatively opposite sides of a plane through the longitudinal axis of the valve cylinder, and a manually operable valve actuator pivotally mounted on the actuator supports and engaging the valve member to slide the same in the cylinder, the improvement comprising: said actuator supports having aligned bearing openings therein, said valve actuator including a first shaft member shorter than the spacing between said actuator supports and having a first pivot portion adjacent one end rotatably received in the bearing opening in one of said actuator supports and an actuator portion integral with and extending laterally of the first shaft member adjacent its other end for engagement with the valve member, said valve actuator including a second shaft member having a second pivot portion intermediate its ends rotatably received in the bearing opening

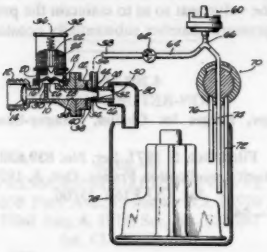
in the other of said actuator supports when one end thereof is adjacent said other end of the first shaft member and a handle portion integral with and extending laterally of the other end of the second shaft member, and shaft connecting means on the adjacent ends of said first and second shaft members for detachably and non-rotatably interconnecting the first and second shaft members in a plurality of different angular positions relative to each other for turning in unison.

4,203,462

WATER LEVEL CONTROL SYSTEM

W. E. Beller, Park Ridge, Ill., assignor to The Singer Company, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,498
Int. Cl.² F15C *1/18*; H01H *35/34*
U.S. Cl. 137—393 **4 Claims**



1. A control system for sensing the water level in a container and effecting a control function in response thereto, the system including a valve controlling flow into the container, a pressure switch having a diaphragm operated switch responsive to pressure in a chamber, characterized by,

a Venturi on the outlet of said valve,

a conduit connected to the low pressure point of the Venturi and having an end terminating at the level in said container to be sensed whereby air is aspirated through the conduit into the Venturi so long as the end of the conduit is above the level in the container,

said conduit being connected to said chamber so the chamber pressure drops to actuate the switch when the container level reaches the end of the conduit preventing further aspiration through the conduit, said switch being actuated in the oppostie sense upon restoration of atmospheric pressure in the chamber through said end of the conduit and check valve in the conduit between the pressure switch and the venturi preventing flow from the venturi to the pressure switch.

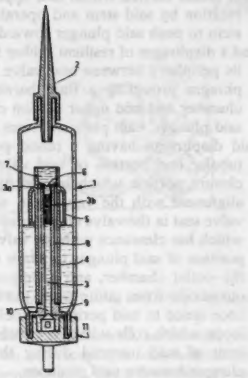
4,203,463

FLOW-REGULATING DEVICE FOR PERFUSION-TRANSFUSION APPARATUS

Victor Ponlot, and Jacques Ponlot, both of 2, Rue Saint Marceaux, Paris 17, France

Filed Apr. 6, 1978, Ser. No. 894,618
Claims priority, application France, Apr. 8, 1977, 77 10711
Int. Cl.² F16K *21/16*
U.S. Cl. 137—403 **11 Claims**

1. A system of flow-rate regulation for perfusers-transfusers commonly known as visual apparatus, comprising a chamber of transparent synthetic material having an upper portion provided with a perforator for admission of liquid into said chamber, a fixed central tube in said chamber, said tube having an upper inlet for fluid and a lower outlet for the fluid, a cylindrical sleeve surrounding said tube, float means operatively associated with said sleeve and tube for producing closure of said upper inlet of said tube when liquid in said chamber drops below a predetermined level, said sleeve and tube defining an annular passage therebetween, said sleeve having an open lower end through which liquid is admitted and flows upwardly through said annular passage and then downwardly through said upper inlet in said tube with the latter open when the liquid in the chamber is above said predetermined level as detected by said float means, said cylindrical sleeve being freely slidable on said fixed central tube and including a flexible diaphragm which closes said upper inlet of said tube when the



liquid in the chamber drops below said predetermined level and said sleeve having an upper end with a cavity located above said flexible diaphragm.

2. A flow-rate regulator system according to claim 1 wherein said cavity is positioned below the perforator for receiving admitted liquid and for containing the liquid until the cavity is filled whereafter the liquid overflows the cavity and enters the chamber.

4,203,464

DIAPHRAGM VALVE FOR FAUCETS

Gerald J. Farrell, Elmhurst, and Rudy Y. Bisonaya, Oaklawn, both of Ill., assignors to Elkay Manufacturing Company, Broadview, Ill.

Continuation-in-part of Ser. No. 711,551, Aug. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 633,445, Nov. 19, 1975, abandoned. This application Mar. 10, 1978, Ser. No. 885,280
Int. Cl.² F16K *11/14*, *7/12*
U.S. Cl. 137—454.2 **17 Claims**

1. A dry stem, faucet valve assembly, comprising:

a valve body having upper and lower sections,

said lower section having an outlet chamber and an inlet for water extending into said outlet chamber, and terminating in an annular valve seat,

said upper section having a cylindrical chamber, aligned with said valve seat,

a cylindrical valve plunger non-rotatably and reciprocably supported in said upper section chamber for movement

along the axis of said valve seat between valve open and valve closed positions, said plunger having a tubular end portion concentric with and having a larger inside diameter than the inside diameter of said valve seat and leaving a clearance space adjacent the outer edge of said valve seat in the closed position of the valve plunger,

a stem projecting from one end of the valve body and extending into said upper section thereof,

cam means carried within said upper section connected for rotation by said stem and operable upon rotation of the stem to push said plunger toward said valve seat,

and a diaphragm of resilient rubber like material mounted at its periphery between said valve body sections, said diaphragm providing a fluid barrier between said outlet chamber and said upper section chamber for maintaining said plunger, cam plate and stem dry,

said diaphragm having a raised portion received in said tubular end portion of said valve plunger and a valve closure portion which is held by said valve plunger in alignment with the valve seat, and pressed against said valve seat in the valve closed position of said plunger, and which has clearance with the valve seat in the valve open position of said plunger to admit water from said inlet to the outlet chamber, and a supporting section extending outwardly from said closure portion through said clearance space to said periphery, including a portion having loops which rolls without stretching beyond the fatigue limit of said material during the stroke of the valve plunger between said positions,

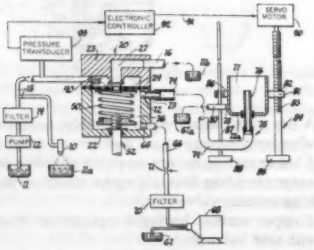
said lower section of said valve body including a second outlet chamber and a second inlet terminating in a second valve seat, said inlets being separate and provided for supply of hot and cold water respectively, a common outlet passage for mixed hot and cold water communicating with both said outlet chambers, a second plunger supported for reciprocation along the axis of said second valve seat, and a second diaphragm mounted between said valve body sections, each of said diaphragms having a valve closure portion adjacent the respective valve seat and adapted to be pressed against the respective valve seat by one of said plungers, said rotary cam plate having separate hot and cold water cam surfaces engaging said plungers respectively, and operable upon rotation of the stem and cam plate to reciprocate said plungers and in combination to move said closure portions of said diaphragms relative to said valve seats to proportion the mixture into said common outlet passage of hot and cold water from said separate inlets.

4,203,465

PRECISION PRESSURE CONTROL VALVE

Paul Rissi, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1979, Ser. No. 24,409
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—487.5 **2 Claims**



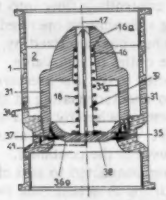
1. In a diaphragm controlled pressure regulator of the type wherein the diaphragm defines with the regulator housing a pressure chamber on one side of the diaphragm and a control chamber on its opposite side, the diaphragm having a closure member associated therewith for cooperating with a valve seat encircling a discharge passage to control fluid discharge from the pressure chamber out through the discharge passage; the improvement comprising an inlet passage in the regulator housing opening at one end into the control chamber and being connectable at its opposite end to a source of fluid; an outlet passage in the regulator housing from the control chamber; a variable height standpipe connected at one end to the opposite end of said outlet passage and having an overflow for fluid at its opposite end; and, a controlled actuator means operatively connected to said standpipe for regulating the effective height thereof as a function of the pressure of fluid in the pressure chamber whereby a regulated control trim fluid pressure can be maintained in the control chamber to control movement of the diaphragm and of the closure member associated therewith relative to the valve seat so as to maintain the pressure of fluid within the pressure chamber substantially constant.

4,203,466

NON-RETURN VALVE

Daniel Hager, Farges les Chalon, Chagny-Saone et Loire, France

Filed Oct. 5, 1977, Ser. No. 839,638
Claims priority, application France, Oct. 5, 1976, 76 30676
Int. Cl.[2] F16K *15/06*
U.S. Cl. 137—543 **12 Claims**



1. A non-return valve, comprising:

a one-piece metal chamber;

an obturator disposed within said chamber;

said obturator having an obturating head and a reverse axial stem;

an obturator guide member disposed within said chamber for axially guiding said obturator at said head and said stem;

said chamber being provided with an internal shoulder;

an L-shaped flexible and elastic annular seal member having a radially-extending annular lip thereof retained between at least a portion of said shoulder and said guide member, and a substantially axially-extending lip thereof disposed adjacent to an inner wall of said obturator guide member;

said guide member having a forward end portion and a rear end portion distal to said forward end portion;

said forward end portion being disposed adjacent to said shoulder;

said rear end being connected to said forward end by a plurality of arms;

each said arm having a substatially straight portion adjacent said forward end portion and a curved portion adjacent said rear end;

a hub having a bore therethrough disposed at said rear end and connected to said arms for guiding said reverse axial stem;

the inner surfaces of said straight portions of said arms forming a bore for guiding said obturator head;

said curved portions of said arms forming a rear fairing to facilitate the flow of a fluid through said non-return valve;

a return spring disposed co-axially around said reverse axial stem between said hub and said obturator head for pressing said obturator head towards said shoulder; said obturator head having a forward peripheral surface defining a leading face from which extends a curved lateral wall portion being curved so as to define a substantially axially-extending portion thereof and wherein a portion of said curved lateral wall sealingly bears against said axially-extending lip of said seal member in the closed position of said valve.

4,203,467

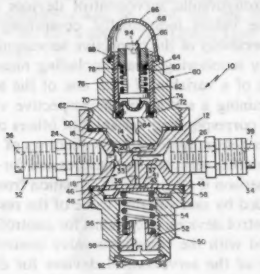
PRESSURE EQUALIZING VALVE

Paul Cardi, 1375 Park Ave., Cranston, R.I. 02920

Filed Aug. 4, 1978, Ser. No. 931,202

Int. Cl.² E03B 7/07

U.S. Cl. 137—557 **12 Claims**



1. A pressure equalizing valve, comprising:

a housing defining a chamber,

said housing having first and second passages therethrough opening into said chamber;

a valve seat in said chamber surrounding the opening of said second passage thereinto;

a diaphragm having its periphery sealed to said housing and forming a wall of said chamber adjacent to said valve seat;

resilient means on the side of said diaphragm opposite said valve seat for urging said diaphragm against said seat with a predetermined force, to seal said second passage from said chamber, and hence from said first passage; and

an indicator mounted on said housing and having a pressure responsive portion in communication with said chamber for indicating when the air pressure therein is below a predetermined value just sufficient to overcome said predetermined force and unseal said second passage,

said valve further comprising a partition dividing said chamber into first and second compartments respectively communicating with said diaphragm and said pressure responsive portion of said indicator, said partition having a permanently open third passage therethrough connecting said compartments.

4,203,468

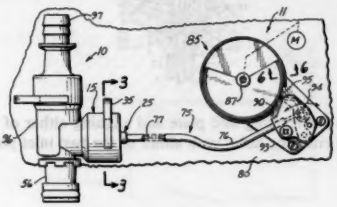
COUPLING FOR JOINING PARTS OF FLUID CONVEYING AND FLUID CONTROLLING DEVICES, AND VALVES UTILIZING SAID COUPLINGS

William A. Dietz, Los Angeles, Calif., assignor to Schurz Corporation, Los Angeles, Calif.

Filed Jan. 30, 1978, Ser. No. 873,356

Int. Cl.² F16K 31/46

U.S. Cl. 137—624.11 **2 Claims**



1. Cam-actuated fluid flow controlling and coupling apparatus, comprising:

a receptacle, an internal receptacle wall, an internal peripheral sealing surface on said receptacle wall, said receptacle wall having a slit therethrough, and a flow passage to and a sealing seat facing into the region bounded by the respective sealing surface;

a coupled member, a peripheral sealing surface on said coupled member, a retention shoulder on said coupled member, said coupled member being insertable into said receptacle with the sealing surfaces in sealing contact and the retention shoulder past the slit, and further including a poppet;

a coupler engageable to the receptacle, said coupler including a key which passes through the slit to engage the receptacle and the retention shoulder whereby to hold the coupled member in the receptacle; and

actuator means to move said poppet toward and away from said seat, said actuator means comprising a cable that includes a sheath and a cable inside the sheath, said poppet being attached to said cable for movement therewith, cam means for shifting the cable in the sheath, said cam means comprising an anchor member and a camming member, the cable being attached to the camming member, and the sheath being attached to said anchor member and to said coupled member, a timer, a cam driven by said timer and contactible by the camming member, whereby to establish the position of the poppet as a function of the cam contour and position, and thereby also as a function of time as determined by the timer.

4,203,469

FOUR WAY REVERSING VALVE FOR AIR CONDITIONING SYSTEMS

James T. Gates, 1611 Kirkley Rd., Columbus, Ohio 43221

Filed Jun. 9, 1978, Ser. No. 914,666

Int. Cl.² F16K 31/16, 11/085

U.S. Cl. 137—625.43 **5 Claims**

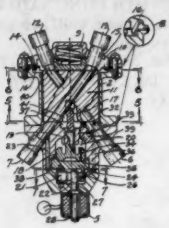
1. A reversing valve including a sealed housing having two inlet ports and two exit ports,

a cylinder plate valve contained in said housing and terminating in two parallel surfaces,

means forming four holes through said plate, each said hole having an opening at each parallel surface, the centerline of each opening being spaced at 90° at each surface,

the two inlet ports being located at one end of the housing and spaced 180° apart, the two exit ports being located at the other end of the housing and spaced 180° apart, the exit and inlet ports being 45° out of rotational phase, two of said holes exit 135° out of phase with their entrance

holes and two of said holes to exit 45° out of phase with their entrance holes,



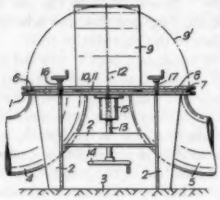
means for rotating said plate and aligning either of two of said entrance holes with either of the two inlet ports.

4,203,470

SAFETY VALVE FOR GAS PIPES

Oddmund Sanne, Oslo, Norway, assignor to Sanne & Wendel A/S, Oslo, Norway

Filed Jul. 24, 1978, Ser. No. 927,437
Claims priority, application Norway, Aug. 5, 1977, 772763
Int. Cl.² F16K *11/02, 25/00, 39/00*
U.S. Cl. 137—625.46 **4 Claims**



1. A safety valve for use on board tankers for simultaneously cutting off a gas pipe and closing the ends of said pipe to prevent gas leakage therefrom, comprising in combination:

a lower fixed plate mounted on the tanker's deck;

a first pair of openings in said fixed plate;

two main pipe lines permanently connected to said openings in said fixed plate;

an upper movable plate rotatably mounted on an axis extending at right angles to said fixed plate;

a second pair of openings in said movable plate;

a 180° pipe bend mounted on said movable plate and terminating in said second pair of openings;

four gaskets respectively arranged around each of said openings in said fixed plate and midway between said openings to create a space between said fixed and movable plates;

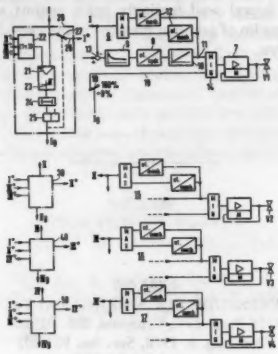
means for raising the movable plate on its axis in relation to the fixed plate so that the movable plate can be rotated from an open position where the openings in the fixed plate are aligned with the openings in the movable plate to a cut-off position where the openings in the movable plate are displaced with respect to the openings in the fixed plate and the movable plate seals the openings in the fixed plate.

4,203,471

MONITORING DEVICE FOR STEAM-TURBINE VALVES

Ernst-Günter Egener, and Wolfgang Kindermann, both of Mülheim, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Aug. 18, 1978, Ser. No. 934,675
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737969
Int. Cl.² F01D *17/24*
U.S. Cl. 137—637 **6 Claims**



1. Monitoring device for steam-turbine valves having respective electrohydraulic servocontrol devices for directly controlling the valves individually, comprising means for monitoring operability of the respective servocontrol devices, said operability monitoring means including means for comparing a value of a variable of each one of the servocontrol devices determining a setting of the respective valve with a mean value of corresponding variables of others of the servocontrol devices determining respective settings of valves associated with the other servocontrol devices and for establishing from the comparison if a permissible deviation from said mean value is exceeded by said variable value of the respective one of the servocontrol devices, and means for controlling a valve drive associated with the respective valve controlled by the respective one of the servocontrol devices for driving it in closing direction thereof when said permissible deviation from said mean value is exceeded.

4,203,472

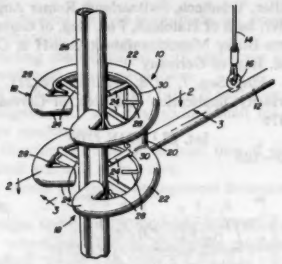
DEVICE FOR STOPPING FLUID FLOW FROM A PIPE

Burrell C. Dulaney, 806 Invader St., Sulphur, La. 70663

Filed Jun. 20, 1978, Ser. No. 917,303
Int. Cl.² F17D *1/16*
U.S. Cl. 137—828 **12 Claims**

5. An apparatus for stopping well fluid blowout from the upper end of a well pipe comprising: support means extending peripherally about at least a substantial portion of the well pipe in surrounding relation thereto, said support means being spaced from the periphery of the well pipe and having one opening formed therein for enabling said support means to be moved laterally of said well pipe into and out of said surrounding relation; at least one heat exchange fluid discharge means mounted on said support means, said discharge means being directed toward the well pipe for discharging heat exchange

fluid onto the peripheral surface of the well pipe to reduce the temperature of well fluids passing therethrough to a tempera-



ture below their solidification temperature whereby stopping flow thereof from the upper end of the well pipe.

4,203,473

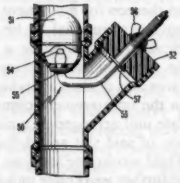
CLOSURE PLUG ASSEMBLY

Walter H. Roberson, Sr., 808 Second St., Altamonte Springs, Fla. 32701

Division of Ser. No. 741,369, Nov. 12, 1976, Pat. No. 4,122,869. This application Apr. 26, 1978, Ser. No. 900,146

Int. Cl.² F16L *55/12*; G01M *3/00*

U.S. Cl. 138—93 **7 Claims**



1. A closure plug assembly for the pressure testing of liquid drain and vent systems having a Y-test section with a test opening, said test assembly comprising:

(a) an inflatable body portion having an inner surface and an outer surface,

(b) a rigid holder portion having a rigid hollow stem section and an expandable plug section having a portion which engages said test opening,

(c) said rigid hollow stem section having an opening directed into the interior of the body portion at one end thereof and extending through the expandable plug section at the other end thereof,

(d) tightening means for securing said plug section in place in said test section throughout the operation of the assembly,

(e) stem end means for connecting the body portion to the rigid holder portion at said one end thereof which end includes a right angled curve, and

(f) valve means being located at said other end of said hollow stem section for inflating the body portion through the hollow stem section,

(g) said other end of the hollow stem section including a further angled curve to fit said assembly to said Y-test section.

4,203,474

DEVICE FOR MECHANICALLY PROTECTING THE ANNULAR EDGE OF A TUBE

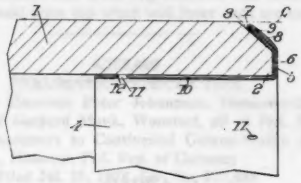
Christian Lequeux, 94, Avenue de Strasbourg, 57000 Metz, and Henri Chapuis, 14, Allee de la Liberation, 57100 Thionville, both of France

Filed Jan. 6, 1978, Ser. No. 867,443

Claims priority, application France, Jan. 7, 1977, 77 00354

Int. Cl.² B65D *59/00, 59/06*

U.S. Cl. 138—96 R **8 Claims**



1. A device for mechanically protecting from impacts the annular edge of a smooth tube end having a diameter greater than 20 cm, said device comprising:

a metal ferrule for mounting the tube end and having a first flap turned radially outwardly and back for covering the tube edge;

a second flap extending from the end of said first flap and turned back to extend radially towards the axis of said ferrule to be disposed between the tube end and said first flap; and

said ferrule being formed by a length of a single blade bent in an arc of a circle, and including shaped plates attached to the internal faces of the two ends of said blade so as to define respectively the two lateral slightly convergent cheeks of a gutter for receiving a flat trapezoidal key introduced therein in the axial direction, said two cheeks being directed so that introduction of said key results in said ferrule being expanded and being forcibly applied against the inner surface of the tube end, and said circular arc extending slightly more than 360° so that said blade two ends overlap.

4,203,475

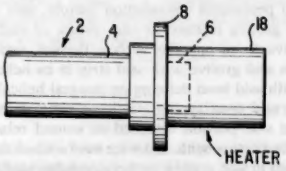
METHOD FOR LINING A FLANGE FACE FOR LINED PIPE AND PRODUCT OF METHOD

Kenneth J. Corey, Fullerton, Calif., assignor to Donald J. Lewis, Irvine, Calif.

Filed Jun. 2, 1978, Ser. No. 912,043

Int. Cl.² B29C *17/10, 27/02*

U.S. Cl. 138—109 **6 Claims**



1. A flanged lined pipe provided with a fusible facing bonded to a fusible inner lining of said lined pipe and adjacent the pipe flange of said lined pipe, said fusible facing for said inner lining being formed by cutting a lined pipe such that the inner lining projects a predetermined distance out of an outer pipe of said lined pipe, said predetermined distance being less than a thickness of a fusible flange ringe, said facing being formed from a flange ring having a stepped bore with a first portion with a first diameter substantially equal to an outer

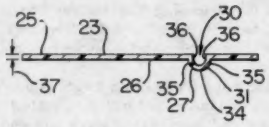
diameter of said inner lining and a second portion having a second diameter equal to an inner diameter of said inner lining, said first portion being of a depth equal to said predetermined distance, heating an outer surface of the inner lining which projects out of the lined pipe and simultaneously heating an inside surface of said first portion of said bore of said flanges ring until the outer surface of the inner lining and the inner surface of said first portion of the flange ring melts and placing the flange ring on the heated inner lining adjacent the pipe flange to form a permanent bond between the inner lining and the first portion of the flange ring.

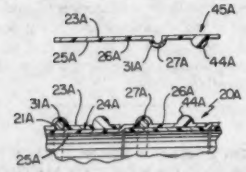
4,203,476

WIRE REINFORCED HOSE

Frank A. Vitellaro, Trenton, N.J., assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 5, 1979, Ser. No. 1,126
Int. Cl.² F16L *11/08*
U.S. Cl. 138—122 **11 Claims**





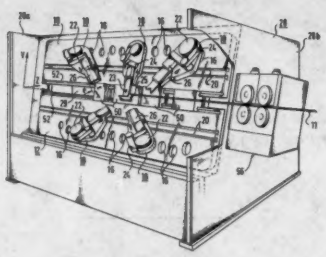
1. In a wire-reinforced hose defined by a helically wound strip of pliable material which has adjoining turns thereof with portions in overlapping relation and a reinforcing wire sandwiched between said portions, the improvement wherein said pliable material is a strip of polymeric material having a flat side portion adjoined by a convoluted side portion which has an integral preformed convolution therein, said convolution defining a groove relative to one surface of said strip and a bead relative to an opposite surface thereof, said wire being disposed in said groove with said strip in its helically wound relation with said bead defining an integral helical bead along said hose, said overlapping portions being defined by said convoluted side portion disposed in wound relation against said flat side portion with said wire sandwiched therebetween and disposed in said groove to thereby define said hose having a substantially smooth tubular inside surface defined solely by adjoining turns of said flat side portion with said wire being concealed when viewing said tubular inside surface, said preformed convolution having a roughly U-shaped cross-sectional configuration defined by a bight and a pair of legs extending in parallel relation from opposite ends of said bight, said legs having inside surfaces which define corresponding surfaces of said groove and said inside surfaces engage said wire and hold same in a precise helical path.

4,203,477

MATERIAL WORKING MACHINE MOUNTING TOOLS IN SEVERAL PLANES

Eduard Brüller, Trimbach, Switzerland; Reiner Augenstein, and Otto Bihler, both of Halblech, Fed. Rep. of Germany, assignors to Otto Bihler Maschinenfabrik GmbH & Co. KG, Halblech, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,271
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741576
Int. Cl.² B21F *1/00*
U.S. Cl. 140—105 **27 Claims**



1. Material working machine such as an automatic punching and bending machine comprising a workplate unit said workplate unit comprising two workplate sections, said workplate sections being spaced from one another and forming a longitudinal slot therebetween extending across at least a part of the area of said workplate unit, at least one material working unit mounted on each of said workplate sections for movement in the plane of said workplate section on which it is mounted about an axis extending through the plane of said workplate section on which it is mounted, said working unit including a tool carrier mounted thereon for movement along a rectilinear path, means for moving a material to be worked over the planes of said workplate sections along a path substantially extending along the longitudinal direction of said slot and forming a working area into or through which said tool carrier is movable, wherein the improvement comprises that at least one further workplate unit arranged in a plane parallel to the longitudinal direction of said slot and defining an angle with the plane of each of said workplate sections, a further working unit mounted on said further workplate unit and being movable in the plane of said further workplate unit and about an axis extending through said further workplate unit, and a tool carrier on said further working unit and being oriented for movement toward said slot and the working area.

4,203,478

AUTOMATIC SHUT OFF DISPENSING NOZZLE

Yoshio Saito, Urawa; Yoshio Shibata, Yokohama, and Satosi Fujiie, Kawasaki, all of Japan, assignors to Tokico, Ltd, Kawasaki, Japan

Filed Aug. 17, 1978, Ser. No. 934,601
Claims priority, application Japan, Aug. 20, 1977, 52-099947
Int. Cl.² B65B *3/26*
U.S. Cl. 141—206 **8 Claims**

1. An automatic shut off dispensing nozzle comprising:
(a) a nozzle main body having therein a substantially straight fluid passage;
(b) a discharge pipe disposed downstream of said fluid passage;
(c) a valve mechanism comprising a main valve lying on a valve seat in said fluid passage for opening and closing said fluid passage and having an auxiliary passage therein which connects the upstream side with the downstream side of said fluid passage, an auxiliary valve for opening and closing said auxiliary passage, both valves having the

same axial line crossing said fluid passage, and a means for biasing said main and auxiliary valves to a normally closed condition;

(d) a lever provided on said main body for operating said valve mechanism;

(e) a first sliding shaft engaged with said lever and axially aligned with said valve mechanism;

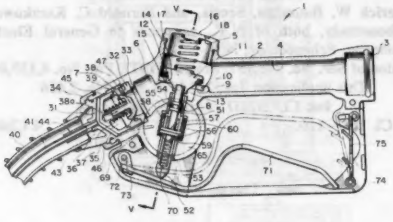
(f) a second sliding shaft slidably fitted in said main body and axially aligned with said first sliding shaft for operating said valve mechanism;

(g) a first shoulder formed on at least one of said second sliding shaft and said main valve;

(h) a roller means providing engagement between said sliding shafts;

(i) a diaphragm for normally retaining said roller means in a position where said sliding shafts are engaged by said roller means;

(j) a negative pressure chamber including said diaphragm;



(k) means for supplying a negative pressure to said negative pressure chamber;

(l) a port provided on said discharge pipe and a conduit for introducing atmospheric pressure from said port to said negative pressure chamber to keep said diaphragm in a position where said sliding shafts are normally engaged by said roller means

(m) said second sliding shaft being responsive to movement of said first sliding shaft by said lever to first open said auxiliary valve and thereafter abut said main valve via said first shoulder to open said main valve, said negative pressure being supplied to said negative pressure chamber when said atmosphere introducing port is closed by fluid to displace said diaphragm and disengage said first and the second sliding shafts engaged by said roller means to automatically close said main and auxiliary valves by said means for biasing.

4,203,479

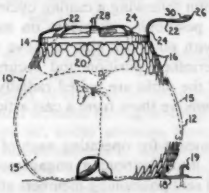
TRASH BAG PROTECTOR

Arlene L. Mathews, 7634 Long, Shawnee Mission, Kans. 66216

Filed May 8, 1978, Ser. No. 903,826

Int. Cl.² B65D *33/24*

U.S. Cl. 150—3 **8 Claims**



1. A trash bag protector comprising:

a body section having a collapsible mesh frame and presenting an open top for trash bag insertion and withdrawal therethrough,

a continuous rim,

means connecting said open top to said rim at spaced points of attachment therearound,

a closure for said open top provided with a plurality of straps having inner and outer ends, and means attaching said outer ends to said rim at spaced zones of attachment thereon, and

said inner ends having cooperating parts for releasably securing said inner ends of said straps to one another, centrally of said rim to cause the straps to converge upon one another at their inner ends and span said top, whereby said straps preclude said trash bag insertion and withdrawal through said open top when said inner ends are secured.

4,203,480

PNEUMATIC VEHICLE TIRE

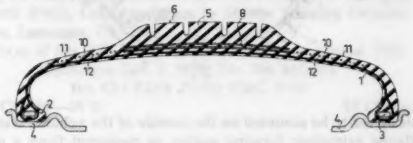
Julius Peter, Hanover; Peter Johannsen, Hannover-Herrenhausen, and Gerhard Mauk, Wunstorf, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,883

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734213

Int. Cl.² B60C *11/00, 9/20*

U.S. Cl. 152—209 NT **6 Claims**



1. A slightly bulged outwardly arched pneumatic vehicle tire which includes:

a carcass;

bead sections;

sidewalls having sections which are essentially cylindrical;

a tread centrally arranged between said sidewall sections and having a width which is narrow in relation to the overall width of said tire; and

reinforcing means located between said carcass and said tread and sidewall sections and pull-resistant in the circumferential direction of said tire, and being intended for effecting lateral stabilization of said tire, said reinforcing means comprising a first belt portion located coaxially mainly below said tread and having at least one threaded ply, the threads of which extend at an angle to the circumferential direction of said tire, and additional second belt portions respectively located projecting essentially axially as an extension of said first belt portion and widening laterally beyond said tread into said sidewall sections and having extending thread at a considerably smaller angle to the circumferential direction of said tire than do the threads of said at least one ply.

4,203,481

PNEUMATIC TIRE, RIM AND COMBINATION THEREOF

William J. Ranik, Jr., Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

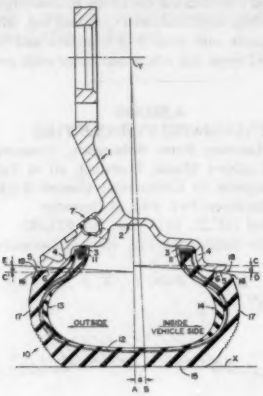
Filed Dec. 11, 1978, Ser. No. 968,542

Int. Cl.² B60C *17/00*

U.S. Cl. 152—330 RF **17 Claims**

1. In combination, a pneumatic tire and rim wherein said tire comprises an annular road-engaging tread surface, sidewalls connecting the lateral edges of said tread surface to annular beads and reinforcing plies connecting said beads and passing through said sidewalls and radially inward of said tread surface, said rim comprising an annular drop center area having bead seats extending axially outward from each lateral edge

thereof, rim flanges located axially outward of each said bead seat and rim flange extensions extending axially outward from each rim flange, the improvement comprising an asymmetric sidewall construction in said tire wherein each said sidewall has an insert of high modulus, low hysteresis rubber compound located on its inner periphery, the insert on the sidewall designed to be mounted on the inside of the vehicle having a greater bulk than the corresponding insert on the sidewall



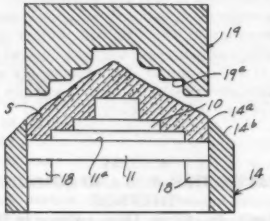
designed to be mounted on the outside of the vehicle, said rim flange extensions forming angles, as measured from a plane parallel to the axis of rotation of said rim, wherein said angle has a negative value on the side of the rim designed to be mounted on the inside of the vehicle and a positive value on the side of the rim designed to be mounted on the outside of the vehicle, whereby when the tire is run flat said rim flange extensions are both parallel to the road surface and each sidewall is equally loaded.

4,203,482

PROCESS FOR PRODUCING CORE OR MOLD PARTS FROM SAND

Leo J. LeBlanc, 3837 Shellmar La., Bloomfield Hills, Mich. 48013

Filed Feb. 27, 1978, Ser. No. 881,770
Int. Cl.[2] B22C *9/12, 15/00*
U.S. Cl. 164—12 **3 Claims**



1. The process of producing core or mold parts useable in the foundry art comprising:

(a) coating sand with a polymerizable resin in an amount which when polymerized binds the sand particles into a useable mass,

(b) placing a pattern mounted on a pattern plate in a walled, open top enclosure with the top of the pattern plate at a predetermined distance below the tops of said walls,

(c) covering the thus confined pattern with a mound of the resin-coated sand until said sand overflows the tops of said walls with the height of said sand mound with respect to the top of the pattern being determined by the angle of least repose of the coated sand and by the highest point of the pattern plate with respect to the tops of said walls,

(d) pressing downwardly onto the sand mound overlying the pattern a squeeze head having a shape conforming generally to the shape of the pattern, thus to compact the sand about the pattern, and

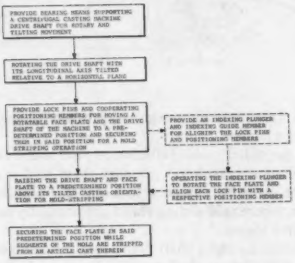
(e) polymerizing the resin in the thus compacted body thereby to produce a useable sand part having a casting surface corresponding to the pattern.

4,203,483

METHOD OF POSITIONING COMPONENTS OF A CENTRIFUGAL CASTING MACHINE FOR A MOLD STRIPPING OPERATION

Frederick W. Baumann, Scotia, and Bernard C. Kaczkowski, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 795,757, May 11, 1977, Pat. No. 4,139,049.
This application Jan. 10, 1979, Ser. No. 2,416
Int. Cl.[2] B22D *13/10, 29/04, 33/04*
U.S. Cl. 164—116 **4 Claims**


PROVIDE BEARING MEANS SUPPORTING A CENTRIFUGAL CASTING MACHINE DRIVE SHAFT FOR ROTARY AND TILTING MOVEMENT
ROTATING THE DRIVE SHAFT WITH ITS LONGITUDINAL AXIS TILTED RELATIVE TO A HORIZONTAL PLANE
PROVIDE LOCK PINS AND COOPERATING POSITIONING MEMBERS FOR MOVING A ROTATABLE FACE PLATE AND THE DRIVE SHAFT ON THE MACHINE TO A PREDETERMINED POSITION AND SECURING THEM IN SAID POSITION FOR A MOLD STRIPPING OPERATION
PROVIDE AN INDEXING PLUNGER AND INDEXING GUIDE MEMBER FOR ALIGNING THE LOCK PINS AND POSITIONING MEMBERS
RAISING THE DRIVE SHAFT AND FACE PLATE TO A PREDETERMINED POSITION ABOVE ITS TILTED CASTING ORIENTATION FOR MOLD-STRIPPING
OPERATING THE INDEXING PLUNGER TO ROTATE THE FACE PLATE AND ALIGN EACH LOCK PIN WITH A RESPECTIVE POSITIONING MEMBER
SECURING THE FACE PLATE IN SAID PREDETERMINED POSITION WHILE SEGMENTS OF THE MOLD ARE STRIPPED FROM AN ARTICLE CAST THEREIN

1. A method for accurately positioning a centrifugal casting machine having an articulated mold mounted on a face plate that is rotatable on a drive shaft and within a housing that supports pulling means for moving segments of the mold in a radial direction to alternately form a mold receptacle for receiving castable material or to separate the mold segments to enable removal of a cast article therefrom, comprising the steps of:

(a) providing bearing means to support said drive shaft for rotation about its longitudinal axis while allowing the drive shaft to tilt along its axis within a predetermined angular range determined by said bearing means,

(b) providing lock pins mounted on said housing for moving said face plate to a predetermined position relative to its axis of rotation following a casting cycle of its operation,

(c) providing positioning members on said face plate to cooperate with said lock pins to move the face plate to said predetermined position and secure it there while segments of the mold are pulled radially away from one another to remove them from a cast article formed in the mold, and

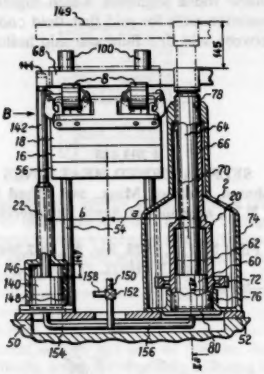
(d) providing means for operating each of the lock pins to move them into positioning engagement, respectively, with each of said positioning members after the face plate has been rotated and stopped to align the positioning members to receive therein said lock pins, whereby said lock pins are effective to force said positioning members and the face plate to a predetermined position relative to the axis of rotation of the face plate thereby to facilitate removal of the mold segments from an article cast therein.

4,203,484

FOUNDRY MOLDING MACHINE FOR THE PRODUCTION OF MOLD HALVES IN MOLD BOXES

Erwin Bührer, Vögelingässchen 40, 8200 Schaffhausen, Switzerland

Filed Jul. 13, 1978, Ser. No. 924,250
Claims priority, application Switzerland, Jul. 22, 1977, 9108/77
Int. Cl.[2] B22C 17/00
U.S. Cl. 164—227 6 Claims



1. A foundry molding machine for producing mold members in mold forming assemblies including a pattern device and mold boxes, said machine comprising means for separating said mold members from said pattern devices, said separating means including generally vertically extending main cylinder means having piston rod means operable to be raised and lowered by operation of said cylinder means, extension means connected to said piston rod means, clamping means including clamping levers on said extension means, said clamping levers being arranged in pairs to hold said molding boxes in clamping engagement, and at least one auxiliary cylinder means including piston means arranged in generally parallel relationship with said main cylinder means and located in laterally spaced relationship therewith in operative position on a side of said mold member opposite said main cylinder means, said auxiliary cylinder means being operatively associated with said main cylinder means and acting on said extension means to provide support during separation of said mold members from said pattern device.

4,203,485

MULTIZONE AIR TERMINAL

Andre H. Zilbermann, 6421 Lavendale, and Melvin S. Aronoff, 11230 Shelterwood La., both of Dallas, Tex. 75230

Continuation of Ser. No. 751,734, Dec. 17, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 960,584
Int. Cl.[2] F24F 13/04
U.S. Cl. 165—2 18 Claims

11. A method for controlling the temperature in first and second volumes comprising:

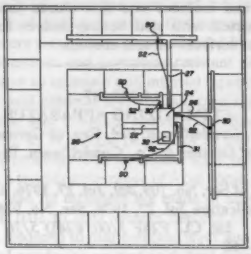
generating a supply of cool air for delivery to the first plenum of a central terminal having first and second plenums;

delivering return air, under pressure, from one of the volumes to the second plenum of said central terminal;

directing air from the first and second plenums throufh a plurality of mixing dampers attached to the first and second plenums, each communicating with one of a plurality of first volumes to be conditioned;

controlling each mixing damper to control the mixture of air from the first and second plenums to the first volumes;

directing air from the first plenum through control dampers attached to the first plenum, each communicating with one of a plurality of second volumes; and



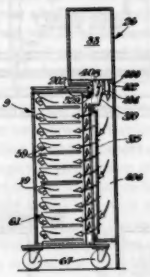
varying the volume of air flow from the first plenum through the control dampers to the second volumes to provide a volume of cool air to the second volumes.

4,203,486

FOOD PREPARATION APPARATUS AND PROCESS

Harry A. Rubbright, Lancaster, Ohio, and Donald A. Springer, North Ridge, Calif., assignors to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 758,454, Feb. 21, 1979, abandoned. This application Jan. 3, 1978, Ser. No. 866,631
Int. Cl.[2] F25B 29/00; F24C 7/10
U.S. Cl. 165—48 R 33 Claims



1. Apparatus for preparing meals for hospitals, airlines and the like comprising a food and beverage cabinet having access doors and a back panel, a rack having heater shelves in said cabinet which support food trays, spaced individual heater surfaces supported by said shelves, air inlet means in said back panel of said cabinet, air outlet means in said back panel of said cabinet, an environmental control unit in the form of a housing having a plenum chamber and a front panel therefor disposed toward said back panel of said cabinet, normally closed air outlet means in said front panel of said plenum chamber, normally closed air inlet means in the said front panel of said plenum chamber, means for circulating chilled air in a first closed loop pattern in said environmental control unit through said plenum chamber when its said inlet means and outlet means are closed, means for coupling said environmental control unit to said food and beverage cabinet so that said back panel of said cabinet is flush with said front panel of said plenum chamber in sealed relationship therewith, said outlet means of said plenum chamber mating with said inlet means of said cabinet and said outlet means of said cabinet mating with said inlet means of said plenum chamber when said cabinet and said environmental control unit are coupled together, means supported by said environmental control unit for opening said outlet means and said inlet means of said cabinet and of said

plenum chamber when said environmental control unit and said cabinet are being coupled together whereby chilled air is continuously circulated through the coupled cabinet and said plenum chamber in a second closed loop pattern which is larger than and includes said first closed loop pattern, and means connected with said heater shelves for heating said spaced heater surfaces on said shelves.

4,203,487

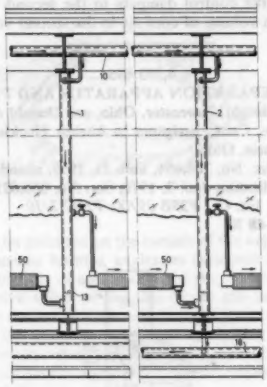
CLIMATIZING APPARATUS

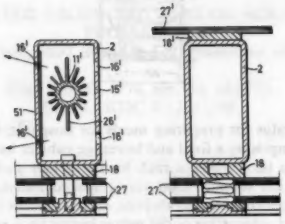
Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Firma Josef Gartner & Co., Gundelfingen, Fed. Rep. of Germany

Continuation of Ser. No. 709,209, Jul. 27, 1976, abandoned. This application Jul. 27, 1978, Ser. No. 928,568

Int. Cl.[2] F24F *3/00*; F24D *5/10*

U.S. Cl. 165—50 **18 Claims**





17. A method of climatizing rooms of a building embodying one or more facade elements in wall structure bounding a room thereof including the steps of providing a frame within said room wall structure to be covered and/or bridged by the facade element or elements, providing that at least a portion of the segments of said frame are hollow and interconnected to define a circulation path extending vertically of and transverse of the facade element or elements, bridging said frame with conduit means providing separate passages which respectively serve for introduction and passage of a first and a second fluid, one adjacent the other, one of which passages communicates with the interior of said hollow segments defining said circulation path which follow said one passage in said path, passing said first fluid the temperature of which has been pre-set at a desired level to move in entry to said conduit means first to and through said one of said passages in a passing heat exchanging relation to said second fluid introduced in an adjacent second of said separated passages and then through said circulation path and discharging said second fluid from said second of said separated passages to flow to, over and adjacent surface portions of the facade element or elements, to provide a two part climatizing system, one part of which is provided by a major heat exchange between said fluids and the direction of said second fluid the temperature of which has been adjusted by said major heat exchange to flow to, over and adjacent the said facade element or elements which are in bridging and/or covering relation to said frame and the other part of which is slow acting and comprised of the means defining said one passage and said hollow frame segments which together therewith define a circulation path for said first fluid and a lesser heat exchange between said first fluid and said hollow frame segments.

4,203,488

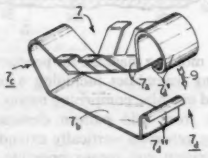
SELF-FASTENED HEAT SINKS

Philip A. Johnson, Melrose, Mass., and Alfred F. McCarthy, Belmount, N.H., assignors to Aavid Engineering, Inc., Laconia, N.H.

Filed Mar. 1, 1978, Ser. No. 882,364

Int. Cl.[2] H01L *23/40*

U.S. Cl. 165—80 B **2 Claims**



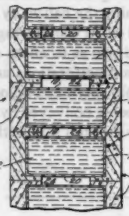
1. Self-fastened heat-sink apparatus comprising first and second broad-area heat-transfer elements of bendable and resilient sheet metal each having a substantially flat broad-area side shaped to abut closely with one of two oppositely-disposed spaced surfaces of a body from which heat is to be withdrawn and dissipated, each of said elements having first and second connection means each integral therewith and projecting therefrom substantially in opposite directions from laterally-opposite edges thereof, the first connection means making an unbroken integral loop-shaped connection between nearby edges of said elements and orienting said elements toward one another for abutting engagements of the broad-area sides thereof with the spaced surfaces of a body therebetween while being resiliently bendable to allow said elements to be spread apart angularly in jaw-like fashion to admit a body therebetween and to be moved toward one another for said abutting engagements, said loop-shaped connection being elongated and forming an open passageway alongside a body held between said elements which exposes it to the ambient environment along both its sides through substantially all of its length, at least one of said elements having a plurality of spaced heat-dissipating projections integral therewith along edges between said laterally-opposite edges, and the second connection means being disposed at the edges laterally opposite said one of said nearby edges and including two separate clasp parts each integral with an edge of a different one of said elements and shaped and disposed to detent and catch with one another when said elements are moved toward one another to produce the said abutting engagements, whereby said elements are movable apart to accommodate insertion of a body therebetween and may then be clasped and locked together while maintaining resilient abutting engagements with surfaces of the body therebetween.

4,203,489

THERMAL ENERGY STORAGE SYSTEM

Stanley F. Swiadek, 2712 W. Alhambra Rd., Alhambra, Calif. 91802

Filed May 31, 1977, Ser. No. 801,632
Int. Cl.[2] F28D 21/00
U.S. Cl. 165—104 S 12 Claims



1. A modular thermal energy storage system comprising:

a plurality of individual thermal energy storage elements, each element having a core for storing thermal energy, a thermally diffusing layer adjacent at least a portion of the exterior surface of the core, and duct means for conducting relatively warmer air for transfer of its thermal energy to the core independently of transfer through the thermally diffusing layer, the core having a greater capacity to store thermal energy per unit of volume than the thermally diffusing layer, the thermally diffusing layer having a lower thermal conductivity than the core and a thickness that will slowly and controllably release, through the thermally diffusing layer to the exterior of the element, the thermal energy stored in the core,

means for assembling the thermal energy storage elements as a unit having an outer wall formed by the thermally diffusing layers, the duct means extending through the unit to transfer thermal energy to the individual cores to store such thermal energy in the cores, the outer wall providing a means for controllably releasing the thermal energy stored in the cores of such elements,

means for passing relatively warmer air through the duct means,

means forming a passage adjacent said outer wall, and

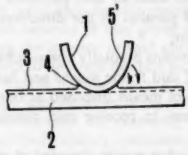
means for passing relatively cooler air through the passage to draw away heat released through the outer wall.

4,203,490

HEAT EXCHANGER CORE HAVING FIN MEMBERS SERVING AS SACRIFICIAL ANODES

Shiro Terai; Zenichi Tanabe, both of Nagoya, and Toshiyasu Fukui, Toyoake, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Oct. 20, 1978, Ser. No. 953,114
Claims priority, application Japan, Oct. 21, 1977, 52-125858
Int. Cl.[2] F28F 19/06
U.S. Cl. 165—134 R 8 Claims



1. In a heat exchanger core comprising a fluid passage member within which a fluid is adapted to flow and outside of which another fluid is adapted to flow, and fin members mounted on the external surface of said fluid passage member, said fluid passage member being made of a brazing sheet consisting essentially of an internal layer made of a core metal and defining the internal layer of said fluid passage member and an external layer made of a cladding metal and defining the external layer of said fluid passage member, the improvement which comprises: said core metal is a material selected from the group consisting of aluminum and corrosion-resistant aluminum alloy, and is effective to maintain said internal layer in a cathodic state relative to said external layer of said cladding metal and said fin members; said cladding metal is an aluminum alloy containing from 6 to 14 weight percent of Si and effective to maintain said external layer in an anodic state relative to said internal layer in a temperature range of from room temperature to 100° C.; and said fin members are made of aluminum alloy containing from 0.02 to 0.09 weight percent of Sn, said fin members being soldered to said external layer and being effective as sacrificial anodes to protect said fluid passage member from corrosion.

4,203,491

CHEMICAL FLOOD OIL RECOVERY WITH HIGHLY SALINE RESERVOIR WATER

Joseph Reisberg, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 5, 1978, Ser. No. 939,521
Int. Cl.[2] E21B 43/22
U.S. Cl. 166—274 6 Claims

1. A process for recovering oil from an oil reservoir in which the salinity of the predominant water phase is at least about 9% by weight and the oil is displaced by injecting into the reservoir, ahead of a relatively low mobility aqueous drive fluid, an aqueous surfactant system in which the surfactant consists essentially of at least one alkylaryloxypolyethoxyethane sulfonate surfactant dispersed within an aqueous liquid which is the same as the aqueous liquid contained in the reservoir or is substantially equivalent to that liquid in salinity, which process comprises:

employing as said surfactant a reservoir-tailored compound or mixture of one or more alkylaryloxypolyethoxyethane sulfonates providing an arrangement of the size and structure of alkyl groups and proportion of ethoxy groups such that, when the reservoir-tailored surfactant is dispersed in said aqueous liquid at the reservoir temperature, the dispersion (a) exhibits an effective optimum or near-optimum oil-displacing activity at a surfactant concentration as low as about 0.1% by weight, (b) is a substantially single-phase system at the reservoir temperature, and (c) is sufficiently viscous by itself or when mixed with noncondensible gas to be capable of exhibiting a mobility at least substantially as low as that of the reservoir oil within the reservoir;

employing as said aqueous liquid one which (a) contains a ratio of about 10 parts by weight of monovalent cation per part by weight of polyvalent cation and (b) is the liquid produced from the reservoir or one that is so similar in salinity as to be capable of maintaining a salinity which is substantially unaltered by ion-exchange reactions which occur when that liquid is flowed within the reservoir;

injecting into the reservoir an aqueous surfactant system consisting essentially of a dispersion of from about 3 to 10% by weight of the reservoir-tailored surfactant within said employed aqueous liquid, with the concentration of the surfactant being sufficient to cause a significant proportion of the injected surfactant system to retain a concentration of at least about 0.1% of the surfactant in spite of the dilution that occurs during the displacement of the surfactant system within the reservoir; and,

injecting into the reservoir immediately behind at least a portion of the injected aqueous surfactant system an aqueous drive fluid consisting essentially of a substantially homogeneous dispersion of noncondensible gas in an aqueous liquid that is the same as the aqueous liquid in which the reservoir-tailored surfactant is dispersed to

form the injected surfactant system or is substantially equivalent to that liquid in salinity, with the injected dispersion being capable, at the reservoir temperature, of exhibiting a mobility within the reservoir at least substantially as low as that of the injected surfactant system.

4,203,492

METHOD FOR ACIDIZING SILICEOUS MATERIALS CONTAINED IN HIGH TEMPERATURE FORMATIONS

David J. Watanabe, Orange, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 885,450, Mar. 10, 1978, Pat. No. 4,148,360. This application Feb. 22, 1979, Ser. No. 14,054

Int. Cl.[2] E21B *43/26, 43/27*

U.S. Cl. 166—300 **29 Claims**

1. A method for acidizing siliceous materials contained in a subterranean formation having a temperature above about 250° F., which comprises:

(a) introducing into a well communicating with said formation (1) a noncorrosive aqueous solution containing a water-soluble alkali metal or ammonium fluoride salt, and (2) a substantially anhydrous treating fluid consisting essentially of a first normally liquid acid precursor having a generalized formula:

$$C_xH_yX_z$$

wherein

$x=1$ or 2;

$y=0$, 1 or 2, but $y \leqq x$; and

$z=2x-y+2$, and

which is thermally stable under the temperature and pressure conditions to which it is exposed in said well, or mixtures thereof; and

(b) displacing said aqueous solution and said treating fluid from said well and into said formation wherein said acid precursor hydrolyzes in situ to generate a hydrohalic acid which combines with said fluoride salt to acidize said siliceous materials.

4,203,493

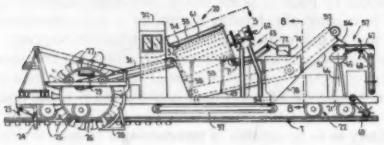
RAILWAY BALLAST CLEANING APPARATUS

John R. Miller, Charlotte, N.C., assignor to Southern Railway Company, Washington, D.C.

Filed Nov. 21, 1978, Ser. No. 962,697

Int. Cl.[2] E01B *27/00*

U.S. Cl. 171—16 **20 Claims**



1. In a railway ballast cleaning apparatus including, in combination, means mounted on a railroad car for removing dirty ballast from the vicinity of the track along which said car travels, ballast cleaning means mounted on said car, and means on said car for conveying the dirty ballast from said removing means to said ballast cleaning means, the improvement wherein said ballast cleaning means includes a drum having a perforate cylindrical wall open at opposite ends, a spiral conveyor mounted on an inner surface of said wall and extending between said opposite ends, an open tank mounted on a horizontal surface of said car and containing a quantity of cleaning liquid, said tank being disposed beneath said drum, said drum being mounted for rotation about an axis inclined relative to said horizontal surface, one of said drum ends constituting an inlet end lying at least partially within said tank below the level of cleaning liquid therein, the other of said drum ends constituting an outlet end lying wholly outwardly of said tank at a higher elevation relative to said inlet end, a spoils conveyor operatively disposed in said tank for the removal from said tank of spoils particles separated from the dirty ballast whereby the dirty ballast which includes the spoils particles may be deposited by said conveying means into said drum through said inlet end so as to be cleaned as it is tumbled by said spiral conveyor during drum rotation into and out of the cleaning liquid for cleaning the ballast by separating the spoils particles therefrom, said drum wall having perforations therein of such a predetermined size as to allow only the spoils particles to move through said perforations and into said tank for removal therefrom by said spoils conveyor, the cleaned ballast remaining in said drum being conveyed by said spiral conveyor outwardly of said drum through said outlet end.

4,203,494

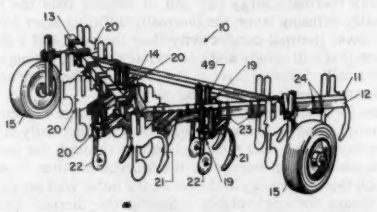
TOOL AND DISK MOUNTING ASSEMBLY

Elmer K. Hansen, 801 S. Martha, Sioux City, Iowa 51102

Filed Dec. 11, 1978, Ser. No. 968,374

Int. Cl.[2] A01B *35/18, 61/04*

U.S. Cl. 172—166 **4 Claims**



1. A reversible mounting assembly for releasably securing a work tool and a coulter to a tool bar of a soil tilling farm implement for pivotal movement of the tool and coulter from normal soil engaging positions to inoperative positions upon encountering an obstruction during a tilling operation, wherein said work tool has a shank member and said coulter a shank section, said mounting assembly comprising:

(a) a base plate with upper and lower surfaces,

(b) elongated frame means fixed to and extended longitudinally of the lower surface of said base plate and having an end portion projected outwardly from one end of said base plate,

(c) means for attachment of said base plate against the under surface of said tool bar such that in one position the projected end portion of said frame means is located to the front of the tool bar and in a reversed position is located to the rear of the tool bar, with the longitudinal axis of the frame means in each of said positions of the base plate being directed parallel to the direction of travel of said farm implement;

(d) tool support means pivotally connectible to the projected end portion of said frame means and having:

(1) a first socket means disposed at one end of said tool support means to receive said shank member of said tool, and

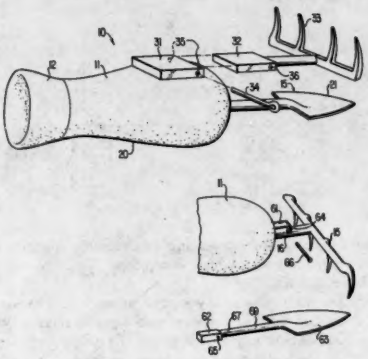
(2) a second socket means disposed at an opposite end of said tool support means to receive said shank section of said coulter, and

(e) yieldable pressure means that coacts with said frame means and said tool support means to normally hold said tool and said coulter in operative positions therefor.

4,203,495
GLOVE AND TOOL DEVICE WITH TWO TOOL ELEMENTS

Frederick S. Crownover, Rte. 1, Box 27, Columbiana, Ala. 35051

Continuation-in-part of Ser. No. 760,553, Jan. 19, 1977, Pat. No. 4,089,379. This application May 2, 1978, Ser. No. 902,081
Int. Cl.[2] A01B 1/20
U.S. Cl. 172—370 7 Claims



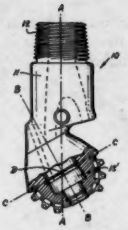
1. In a glove and tool device which includes a longitudinally extending glove element having upper and lower portions connected by side portions and an opening at one end thereof for insertion of the hand of a user of the device, and wherein a first tool element is attached to said glove element and extends outwardly from the exterior of said glove element, a bar grip being positioned on the interior of said glove element with its ends fixedly attached to opposite interior portions of said glove element, and including a first longitudinally extending handle member having one end thereof attached to the bar grip and the other end attached to said first tool element, the improvement comprising means attached to said glove element for receiving a second tool element, and a second tool element connected by a second longitudinally extending handle to said receiving means and extending outwardly from the exterior of said glove element, said receiving means being positioned on the upper portion of said glove element on the exterior surface thereof, said first and second tool elements being generally aligned one over the other and said first and second handles of said tool elements extending substantially parallel to the longitudinal axis of said glove element and to each other, so that one of said tool elements is in the operative position when the device is in an upright position and the other tool element is in the operative position when the device is in an inverted position.

6. In a glove and tool device which includes a longitudinally extending glove element having upper and lower portions connected by side portions and an opening at one end thereof for insertion of the hand of a user of the device, and wherein a first tool element is attached to said glove element through a first longitudinally extending handle member which extends outwardly from the exterior of said glove element, a bar grip being positioned on the interior of said glove element with its ends fixedly attached to opposite interior portions of said glove element, said first handle member having its inner end secured to said bar grip, the improvement comprising means attached to said first handle member for receiving a second tool element, and a second tool element connected by a second longitudinally extending handle to said receiving means and extending outwardly from the exterior of said glove element, said receiving means being positioned on the upper surface of said first handle, said first and second tool elements being generally aligned one over the other and said first and second handles of said tool elements extending substantially parallel to the longitudinal axis of said glove element and to each other, so that one of said tool elements is in the operative position when the device is in an upright position and the other tool element is in the operative position when the device is in an inverted position.

4,203,496
LONGITUDINAL AXIS ROLLER DRILL BIT WITH GAGE INSERTS PROTECTION

William Baker, III, Costa Mesa, and Charles R. Harris, Whittier, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 16, 1978, Ser. No. 951,978
Int. Cl.[2] E21B 9/08; E21C 13/01
U.S. Cl. 175—329 8 Claims



1. A rotary bit for drilling wells comprising:

a bit body rotatable about a first axis, said bit body adapted to be secured to a drill column, said bit body further including a journal pin extending downwardly therefrom, said journal pin having a second axis disposed at an angle with respect to and intersecting said first axis; and

a cutter rotatively mounted on said journal pin to rotate about said second axis, said cutter having an outer surface extending from an apex to an annular gage surface, said gage surface terminating adjacent a base or heel portion of said cutter, said gage surface oriented in such a manner that a plane extending therethrough intersects the point of intersection of the first and second axes, said gage surface having a plurality of cutting elements mounted thereon, each cutting element comprising a cutting surface made of a synthetic diamond material mounted on a base, said cutter further includes raised areas formed on said base or heel portion substantially around the back portions of said cutting elements in order to protect said cutting elements during the non-cutting cycle of the cutting elements

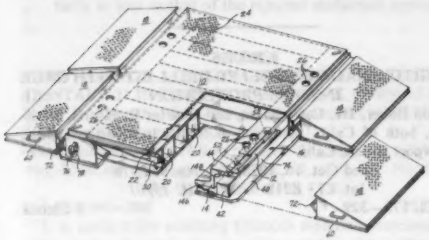
4,203,497
PORTABLE LOAD SCALE FOR MINING TRUCKS AND THE LIKE

Carl R. Harris, Lynnwood, and Robert W. Blaylock, Bothell, both of Wash., assignors to Evergreen Weigh, Inc., Lynnwood, Wash.

Filed Jul. 24, 1978, Ser. No. 927,581
Int. Cl.[2] G01G 19/02, 21/28
U.S. Cl. 177—134 25 Claims

1. In a load scale of the type wherein a platform supporting a vehicle and load to be weighed has a plurality of load cells disposed under and across a pair of opposed ends thereof and between said platform and a supporting surface, the improvement comprising a plurality of Z-shaped lateral support beams having an upper flange and a lower flange thereon and extending across each end of said pair of opposed ends of said platform between said platform and said plurality of load cells with said lower flange extending under a portion of said platform, said lower flange carrying same by a region on said beam being relatively massive thereby reducing the total stress in the area

on said beam carrying said platform and being secured to said platform in a region on said beam where forces reacted by the means securing same are low enabling said load scale to carry



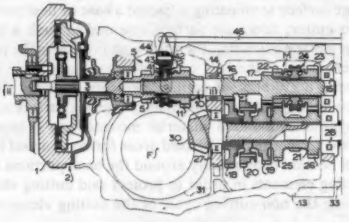
substantially large loads, and wherein the upper flange of said support beams spans the gap between adjacent load cells and rests across the tops thereon.

4,203,498

TRANSMISSION APPARATUS FOR MOTOR VEHICLE

Masayuki Kodama, Tokyo, Japan, assignor to Fugi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1978, Ser. No. 918,336
Int. Cl.[2] B60K *17/06*
U.S. Cl. 180—70 MS **5 Claims**



1. Transmission apparatus in a motor vehicle having a front axle, comprising

an engine,

a clutch device,

a clutch housing, said clutch device is disposed in said clutch housing,

a main transmission housing,

a 2-speed sub-transmission operatively connected to said clutch device, and a main transmission operatively connected to said sub-transmission and disposed in said main transmission housing,

a final reduction gear connected to the front axle and to said main transmission,

a final reduction gear housing, said sub-transmission and said final reduction gear directly therebelow with the front axle are disposed in said final reduction gear housing,

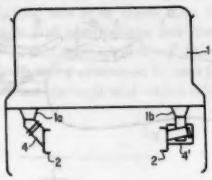
the engine, said clutch housing, said final reduction gear housing and said main transmission housing are disposed substantially horizontally one behind the other.

4,203,499

APPARATUS FOR PREVENTING OR DAMPING VIBRATIONS AND NOISE IN A VEHICLE

Koji Miyata, Kariya, Japan, assignor to Toyota Shatai Kabushiki Kaisha, Aichi, Japan

Filed Dec. 27, 1977, Ser. No. 864,774
Claims priority, application Japan, Dec. 27, 1976, 51/159882; Jan. 26, 1977, 52/8155; Jan. 28, 1977, 52/8917
Int. Cl.[2] B62D *25/00*
U.S. Cl. 180—89.12 **8 Claims**



1. An apparatus for preventing or damping vibrations and noise in a vehicle body, which comprises:

a vehicle chassis;

at least one pair of laterally spaced mounting units for supporting said vehicle body on said vehicle chassis, which are disposed on opposed sides of the vehicle centerline, each of said at least one pair of mounting units being composed of two bracket members to be fixed to said vehicle body and said vehicle chassis; and

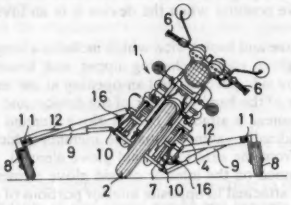
connecting means connecting said two bracket members through a vibration proofing material, said connecting means of each said at least one pair of mounting units exhibiting different dynamic characteristics from each other, said connecting means further causing the phases of vibrations transmitted from said vehicle chassis through said at least one pair of mounting units to become different from each other and causing vibrations transmitted through said at least one pair of mounting units to interfere with each other to prevent or dampen vibrations and noise in the vehicle body.

4,203,500

APPARATUS FOR PREVENTING TURNOVER OF A MOTORIZED TWO-WHEELED VEHICLE

Tadashi Kamiya, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 927,596
Claims priority, application Japan, Jul. 25, 1977, 52-88300
Int. Cl.[2] B62D *61/04*
U.S. Cl. 180—219 **7 Claims**



1. Apparatus for preventing turnover of a motorized two-wheeled vehicle comprising a vehicle body, front and rear wheels supporting said body, a drive engine supported on said body between said wheels to provide a center of gravity for the vehicle in the vicinity of the engine, a pair of left and right arms extending laterally from the vehicle body and pivotally connected thereto for upwards and downwards movement, subsidiary wheels supported on said arms, a first and second

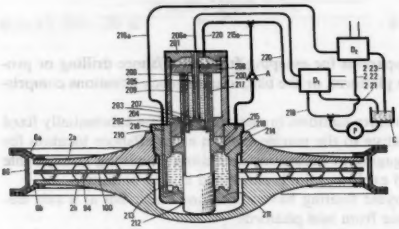
damper means between the body and respective arms, tube means interconnecting the first and second damper means, and flow control valve means in said tube means for activating said second damper means in response to action on said first damper means, said wheels being positioned by said arms to be disposed on a line extending in the vicinity of said center of gravity.

4,203,501

DEVICE FOR EMITTING ACOUSTIC WAVES IN A LIQUID MEDIUM

Jacques Cholet, Rueil-Malmaison; Jean Laurent, Saint Germain-en-Laye; Pierre Magneville, Vernouillet, and Claude Duconge, Le Vesinet, all of France, assignors to Institute Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 417,570, Nov. 20, 1973, Pat. No. 4,103,280.
This application May 9, 1978, Ser. No. 904,324
Claims priority, application France, Nov. 29, 1972, 72.42515
Int. Cl.[2] G01V *1/04;* F16J *1/10*
U.S. Cl. 181—120 **8 Claims**



1. A device for emitting acoustic waves in a liquid medium, comprising at least two elements movable in opposite directions, said elements being made of a rigid material and connected with a tightening membrane forming a tight enclosure therewith, each of said elements comprising at least one area for intermittent application against a corresponding contact area of an opposite element, means for moving said areas apart from each other comprising a push-member adapted to bear onto one of the movable elements, releasable means for locking said movable elements in spaced apart position, means for limiting the deformation of said tightening membrane toward the inside of the enclosure, and means for creating in said enclosure a pressure much lower than the pressure to which the enclosure is externally subjected, in operation of the device, wherein the means for moving said areas apart from each other further comprise fluid pressure operated jack means including two cylinders associated with the other of the movable elements for intermittently pushing the push-member in a direction towards said one element, and the releasable locking means comprises a valve member connected with said push-member, pressure means for moving said push-member towards said one element by exerting different fluid forces in one of the cylinders on opposite faces of the valve member in a manner intermittently maintaining said valve member in abutment against an end portion of said one of the cylinders regardless of fluid pressure conditions in the other of the cylinders and means for feeding said cylinders with pressurized fluid for controlling operation of the jack means.

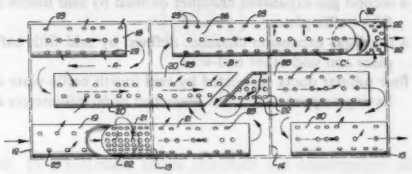
4,203,502

MUFFLER

Walter F. Strader, 7358 Deering Ave., Canoga Park, Calif. 91303

Filed Aug. 28, 1978, Ser. No. 937,143
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—238 **12 Claims**

1. A muffler comprising an outer tubular housing adapted to be connected at one end to receive and convey the exhaust gases from an internal combustion engine therethrough; said housing including a muffler core of a preselected configuration comprising a plurality of exhaust chambers for silencing the audible vibrations in the exhaust gas stream, each chamber having a partition at each end defining the longitudinal extent of a closed chamber, each exhaust chamber being arranged in serial arrangement for receiving the exhaust gases adjacent one partition and discharging the gases to the successive exhaust chamber through an aperture arranged at a preselected location in the other partition, each exhaust chamber is characterized as comprising a gas conduit extending through a common partition between a pair of chambers for conveying the gases therebetween, said gas conduit having a closed end at the gas entry end thereof in one chamber and an open end at the gas discharge end thereof in the other chamber, the entry end of the gas conduit being defined with a closed end wall arranged at a preselected angular relationship, other than a right angle, with the longitudinal axis thereof and the portion of the gas conduit extending on the gas entry side of a partition being provided with a multiplicity of closely spaced perforations for conveying and shredding the gas as it enters through the perforations, the gas discharge portion of the gas conduit having a plurality of apertures spaced therearound and longitudinally thereof in a preselected spacing,



first means for conveying a portion of the exhaust gases to be silenced through the gas entry partition at one end of the muffler for impingement with the intra-chamber partition for causing said exhaust gases to reverse their direction of flow,

second means for conveying the remaining portion of the exhaust gases to be silenced through the gas entry partition at one end of the muffler for impingement with the closed end of said gas conduit and to exit the chamber through said multiplicity of closely spaced perforations, the exhaust gases exiting said gas conduit so as to impinge against the partition at the opposite end of the muffler,

third means arranged in the intra-chamber partition for receiving and conveying the exhaust gases discharged into the chamber including by said first means for discharging the exhaust gases into the adjacent chamber, and

means for conveying the silenced exhaust gases from the partition at the opposite end of the muffler.

4,203,503

EXHAUST SILENCER FOR A RAILWAY LOCOMOTIVE

Luigi Franco, Turin, and Giorgio Bertotti, Vinovo, both of Italy, assignors to Centro Richerche Fiat S.p.A., Orbassano, Italy

Filed Apr. 27, 1979, Ser. No. 34,038
Claims priority, application Italy, May 17, 1978, 53326/78[U]
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—272 **7 Claims**

1. Exhaust silencer for a railway locomotive having a supercharged diesel engine with six cylinders and a power rating of about 200–250 HP comprising:

a hollow cylindrical body;

respective end-walls closing the opposite ends of said body;

an induction pipe, a portion of which traverses one said end-wall, and

an exhaust gas outlet pipe traversing the other said end-wall, wherein the improvement consists in said silencer body

having an internal diameter of 340 millimeters, a length of 2200 millimeters and comprising:

a first dished baffle-plate located 710 millimeters from said one end-wall;

a first resonance chamber defined by said one end-wall and said first baffle-plate;

a second dished baffle-plate located 200 millimeters from said first baffle-plate;

a second resonance chamber defined by said first and second baffle-plates;

a third dished baffle-plate located 110 millimeters from said second baffle-plate;

a third resonance chamber defined by said second and third baffle-plates;

a fourth dished baffle-plate located 330 millimeters from said third baffle-plate;

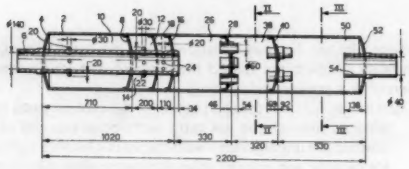
a first gas expansion chamber defined by said third and fourth baffle-plates;

a fifth dished baffle-plate located 320 millimeters from said fourth baffle-plate and 530 millimeters from said other end-wall;

a second gas expansion chamber defined by said fourth and fifth baffle-plates;

a third gas expansion chamber defined by said fifth baffle-plate and said other end-wall;

four tubular ducts supported by said fourth baffle-plate and having respective internal diameters of 60 millimeters and



respective centres equally spaced about a circumference, concentric with the longitudinal axis of said body, with a diameter of 180 millimeters, each of said ducts extending for a length of 46 millimeters into said first expansion chamber and for a length of 54 millimeters into said second expansion chamber;

four tubular ducts supported by said fifth baffle-plate and having respective internal diameters of 60 millimeters and respective centres located upon a circumference, concentric with said longitudinal axis of said body, with a diameter of 180 millimeters and angularly displaced by 45° with respect to said ducts on said fourth baffle-plate, said four tubular ducts on said fifth baffle-plate extending into said second gas expansion chamber for a length of 69 millimeters and into said third gas expansion chamber for a length of 92 millimeters, and wherein:

said resonance and gas expansion chambers are arranged in series longitudinally of the body;

said portion of said induction pipe has an internal diameter of 140 millimeters and extends through said resonance chambers to said first gas expansion chamber, projecting into the latter for a length of 34 millimeters;

said portion of said induction pipe has respective aperture means communicating with the respective said resonance chambers, and

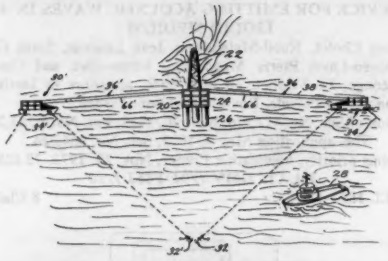
said exhaust gas outlet pipe has an internal diameter of 140 millimeters and a portion which extends into said third gas expansion chamber for a length of 138 millimeters.

4,203,504

METHOD AND SYSTEM FOR ESCAPING FROM AN OFFSHORE DRILLING PLATFORM

Ronald H. Reynoir; Robert A. Flautt, both of New Orleans, La., and Clyde M. Leavitt, Ocean Springs, Miss., assignors to The Reynoir Company, New Orleans, La.

Filed Oct. 16, 1978, Ser. No. 951,460
Int. Cl.² A62B *1/02*; B63C *9/02*
U.S. Cl. 182—10 **32 Claims**



1. Apparatus for escaping from an offshore drilling or production platform, or the like, in emergency situations comprising:

an offshore platform in operative position substantially fixed relative to the marine bottom at an offshore location for engaging in hazardous operations involving combustible and explosive fluids entrapped in said bottom;

a buoyant floating haven positioned near but at a safe distance from said platform;

a plurality of anchors arranged about said haven and engaged with the marine bottom;

cables attached to said anchors and to said haven for maintaining the latter in its said position;

a cableway unsupported between its ends attached to and extending above water between said haven and said platform; and

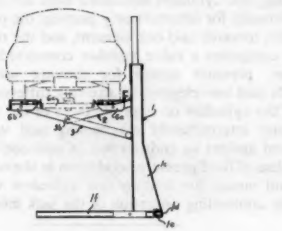
a personnel carrier suspended from and movable along said cableway for transferring personnel from said platform to said haven.

4,203,505

CAR HOIST

Rolf G. Johansson, S 130 11 Saltsjo-Duvnas, Sweden

Filed Jan. 3, 1979, Ser. No. 994
Int. Cl.² B60S *13/00*
U.S. Cl. 187—81.7 **16 Claims**



1. A device for lifting an object, comprising: an upright vertical mast section; a substantially linear lifting motor included within said mast sections; a lifting arm having an inner end slidably mounted onto said mast section and freely extending outwardly therefrom, said inner end being pivotally connected to said motor; and a lifting fork pivotally connected to a free end of said lifting arm; said lifting arm and said lifting fork, in their lowest position, extending horizontally out-

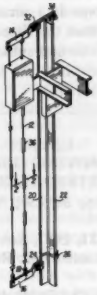
wardly from said mast section; the inner ends of said arm and said fork being hingedly mounted and vertically-displaceably guided onto said mast section in such a manner that, when said inner end of said lifting arm is first vertically displaced from said lowest position by said lifting motor a given upward distance along said mast section, said lifting arm pivots about its inner end to an outward and downward inclined position and said lifting fork pivots about its inner end to an outward and upward inclined position; said lifting motor thereafter causing the inner end of said lifting arm to travel a further upward distance along said mast section and to cause the displacement of the inner end of said lifting fork while maintaining the relative inclined position of said lifting arm and said lifting fork.

4,203,506

ELEVATOR CONTROL

Sidney Richmon, 5800 W. Club La., Richmond, Va. 23226

Filed Dec. 2, 1977, Ser. No. 856,957
Int. Cl.[2] B66B *1/36*
U.S. Cl. 187—29 R **5 Claims**



1. A control system for automatically controlling the motion of a body in either of two opposite directions along a track past a plurality of stations including end stations and at least one intermediate station so as to position said body at selected stations comprising:

step indicator means extending along selected first segments of said track, each of said first segments being of a predetermined length;

sensor means on said body comprising at least first, second, and third sensor elements positioned along a line parallel to said track such that each sensor will sense said step indicator means when that sensor is positioned adjacent the step indicator means along a line transverse to said track, the distance between said first and second sensor elements and the distance between said second and third sensor elements each being less than the predetermined length of said first segments and the distance between said first and third sensor elements being greater than the predetermined length of said first segments,

means for disabling said second sensor for as long as either of the first or third sensors senses the step indicator means, but only when that first or third sensor senses the step indicator means before the second sensor senses the step indicator means, and

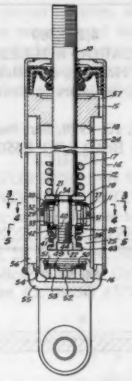
counter means for indicating the station being approached by said body, said counter means counting up when said first and second sensors simultaneously sense said step indicator means and for counting down when said second and third sensors simultaneously sense said step indicator means.

4,203,507

SHOCK ABSORBER

Takao Tomita; Nobuo Anno, and Hitoshi Yamamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 792,203, Apr. 29, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,611
Int. Cl.[2] F16F *9/348*
U.S. Cl. 188—317 **11 Claims**



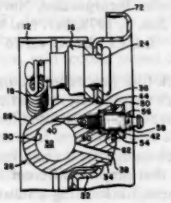
10. In a hydraulic shock absorber, the combination of: a cylinder, a piston mounted to slide in said cylinder and having a plurality of passages extending axially therethrough, a plurality of flexible valve plates held in axial alignment at a second end of said piston, said plurality of flexible plates each having at least one second orifice, said second orifice in each said plate being mutually aligned and in communication with at least one of said plurality of passages, said flexible plates being proressively more flexible away from said piston and said second orifices being progressively smaller away from said piston, and a first check valve spring biasing said flexible plates towards said piston, said first check valve spring extending to hold said flexible plates at an inner periphery thereof such that said flexible plates move axially away from said piston with said first check valve spring during high range piston velocities.

4,203,508

WHEEL CYLINDER ATTACHMENT

Donald F. Borkowski, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 3, 1978, Ser. No. 921,919
Int. Cl.[2] F16D *65/22, 51/24*
U.S. Cl. 188—325 **2 Claims**



1. In a drum brake assembly having a backing plate supporting a pair of brake shoes, a wheel cylinder cooperating with the pair of brake shoes to urge the latter to a braking position and connecting means attaching the wheel cylinder to the backing plate, the improvement wherein said connecting

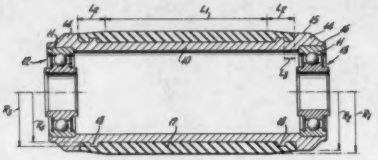
means comprises a flange secured to the backing plate and a nut forming an interlocking fit with the flange, the wheel cylinder including a stepped bore having a small diameter portion and a large diameter portion, the small diameter portion receiving a fitting and the large diameter portion receiving the nut, said nut extending through an opening in said flange to releasably engage said large diameter portion and said nut including an opening for receiving said fitting, said fitting defining an open space with said nut to maintain said fitting in spaced relation thereto.

4,203,509

CARGO ROLLER

Richard T. Thompson, Haddam, and Richard J. Matt, W. Simsbury, both of Conn., assignors to Textron, Inc., Providence, R.I.

Filed Jun. 23, 1978, Ser. No. 918,355
Int. Cl.[2] B64D 9/00; B65G 13/00
U.S. Cl. 193—37 **17 Claims**



1. A cargo roller comprising, in combination, an elongate rigid tubular body with a radially outward circular flange at each axial end, radial-bearing means having separate outer bearing rings fitted to the axial ends of the bore of said body in substantial axial register with said flange, the outer surface of each body being of lesser radial extent than said flanges and generally cylindrical between said flanges, thereby defining an elongate relatively shallow circumferentially continuous groove between said flanges, a solid circumferentially continuous cylindrical deformable tire of cured hardenable material filling said groove and having a primary elongate cylindrical outer surface of diameter slightly exceeding the diameter of said flanges, the outer surface of said tire being gently tapered at its axial ends into substantially radial conformance with said flanges at adjacency with said flanges, whereby normal loads on said roller are sustained by said bearing rings via the cylindrical outer surface of said tire with said flanges retaining said tire against axial distention, and whereby excessive or overloading loads on said roller are sustained by said bearing rings via said flanges as direct radial loads on said bearing rings.

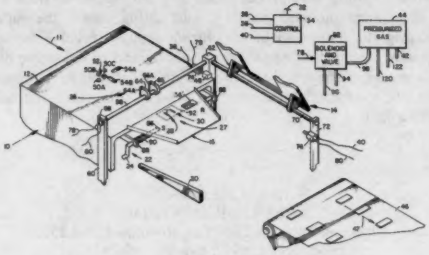
4,203,510

PNEUMATIC DIVERTER FOR HYBRID THICK FILM SUBSTRATE PROCESSING EQUIPMENT

Charles J. Reed, Corrales, N. Mex., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jun. 5, 1978, Ser. No. 912,269
Int. Cl.[2] B65G 47/26
U.S. Cl. 198—437 **1 Claim**

1. In hybrid thick-film processing equipment wherein processed substrates are sequentially moved to a first location on a raised chute that is subsequently tilted for sliding a processed substrate there in a first direction to a second location on a conveyor belt which transports it away from the equipment in a second direction that may be different from the first direction: the improvement, for locating a substrate at a third location on the belt that is spaced generally transversely of the second location, wherein the chute has a first opening through it at the first location, and including first means selectively producing a supply of pressurized gas under the first opening for passing a stream of gas through it in the direction of and generally at an angle $\theta 1$ with respect to the top surface of the chute which is sufficient for moving a substrate located at the first location and over the first opening in a third direction that is generally transversely of the first direction while on the chute, tilting of the chute causing the moved substrate to be deposited in the third location on the belt; saif first means being selectively operative at one time for producing a supply of gas of a first pressure under the first opening for moving one substrate over it a first distance in the third direction, and is



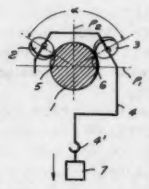
selectively operative at another time for producing a supply of gas of a second pressure under the first opening for moving a subsequent substrate over it a second distance in the third direction which is less than the first distance, such that tilting of the chute places the one and subsequent substrates at transversely spaced-apart positions on the belt, which preclude their overlapping each other.

4,203,511

DEVICE FOR MOVING OBJECTS ALONG A PREDETERMINED PATH

Joachim Uhing, Dorfstede 34, 2300 Molfsee iib Kiel, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,578
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2653009
Int. Cl.[2] B65G 47/26
U.S. Cl. 198—458 **1 Claim**



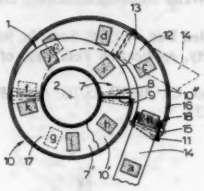
1. A device for moving a curtain between an open and a closed position comprising an elongated rotatable shaft having a circular peripheral surface; means for rotating the shaft in one and in an opposite direction; and a plurality of suspension means arranged spaced from each other along and suspended on said shaft and each comprising at least two rolls frictionally engaging said peripheral surface and arranged displaced from each other in the circumferential direction of said peripheral surface and a hook-shaped frame extending only partly about said shaft and carrying said rolls with the axes thereof including fixed angles with the longitudinal axis of said shaft, said frame having a lower end portion below and vertically aligned with the shaft axis and ending in a hook so that successive portions of a curtain may be connected to the hooks of successive suspension means and the curtain be moved between an open and a closed position during rotation of said shaft in the one and the opposite direction, the axes of the rolls on successive suspension means including with the shaft axis an angle which increases from one to the next suspension means so that

successive suspension means move during rotation of said shaft with increasing speeds.

4,203,512
HELICAL CONVEYOR

Thomas C. M. Ammeraal, Wormer, Netherlands, assignor to Ammeraal Nederland B.V., Wormerveer, Netherlands

Filed Aug. 10, 1978, Ser. No. 932,664
Claims priority, application Netherlands, Aug. 12, 1977, 7708894
Int. Cl.[2] B65G *37/00, 21/18*
U.S. Cl. 198—594 **20 Claims**

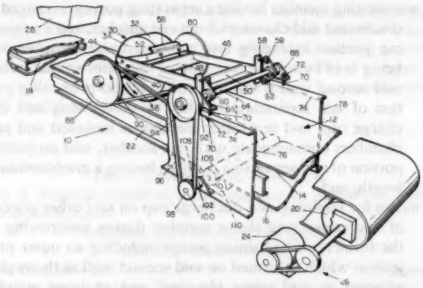


1. A helical conveyor for transporting along a helical stretch, having a substantially vertical central axis and equipped with an endless conveyor belt; an upper run of said conveyor belt following a helical path and ending at a lower end and at an upper end in a substantially horizontal generating line; one end of an intermediate conveyor, which follows a path in a substantially horizontal plane, adjoining the lower end of the upper run of the conveyor belt of the helical conveyor; the other end of said intermediate conveyor being removed farther than its aforementioned end from the vertical central axis of said helical conveyor so that said other end of said intermediate conveyor lies outside the vertical projection of the helical path of said conveyor belt of said helical conveyor on the aforementioned horizontal plane; and a feed or discharge conveyor, displaceable with respect to said intermediate conveyor, joining said intermediate conveyor.

4,203,513
METERING APPARATUS

Lyle W. Scheppele, Dubuque, Iowa, assignor to Toledo Stamping & Manufacturing Company, Toledo, Ohio

Filed Apr. 4, 1978, Ser. No. 893,442
Int. Cl.[2] B65G *37/00*
U.S. Cl. 198—620 **2 Claims**

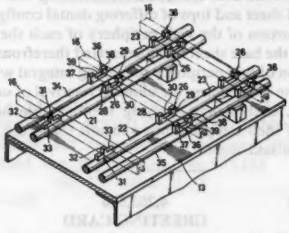


1. Metering apparatus for metering feed comprising a conveyor belt having an upper run and a lower run, a generally cylindrical metering member located above a portion of the upper run of said belt, a shaft extending transversely of said belt on which said generally cylindrical metering member is mounted, a pair of arms having end portions rotatably carrying said shaft, a pivot rod mounted on the other end portions of said arms, means supporting said pivot rod above the upper run of said belt, a driven member mounted on said shaft, an intermediate drive member rotatably mounted on said pivot rod, an intermediate driven member rotatably mounted on said pivot rod and rotatable with said intermediate drive member, a drive member, a drive roller engaged with an upper surface of the lower run of said belt and connected to said drive member to rotate same, a pinch roll on each side of said drive roller with the lower run of said belt extending around said drive roller between said pinch rolls, means connecting said drive member and said intermediate driven member, and means connecting said intermediate drive member and said driven member to rotate said generally cylindrical metering member when said roller is driven by said belt, said metering member being rotated with a peripheral speed substantially equal to the lineal speed of said belt.

4,203,514
APPARATUS FOR FEEDING WORKPIECES INTERMITTENTLY

Mitsuru Hirai, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 28, 1977, Ser. No. 846,364
Claims priority, application Japan, Oct. 30, 1976, 51-130919
Int. Cl.[2] B65G *47/90*
U.S. Cl. 198—774 **6 Claims**



4. An apparatus for feeding workpieces intermittently, comprising:

(a) a table;

(b) a pair of parallel feed rods supported on said table and spaced apart from each other to carry the workpieces jointly thereon, each of said feed rods having thereon a plurality of workpiece holders spaced therealong one from another at at an interval;

(c) first means on said table for moving said feed rods axially between advanced and retracted positions for a stroke which is equal to said interval;

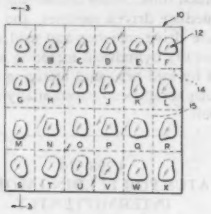
(d) second means on said table for alternately (1) both restraining and supporting the workpieces while said feed rods are being moved from said advanced to said retracted positions and (2) disengaging the workpieces while said feed rods are being moved from said retracted to said advanced position, said second means comprising a pair of axially fixed parallel support rods rotatably supported on said table and spaced apart from each other to carry the workpieces jointly thereon, said support rods extending adjacent and parallel to said feed rods, and each of said support rods having thereon a plurality of second workpiece holders spaced therealong one from another at an interval which is equal to said first-mentioned interval; and

(e) third means on said table for rotating said feed rods about their axes between a first position in which said workpiece holders can engage the workpieces at said retracted feed-rod position and a second position in which said workpiece holders can disengage the workpieces at said advanced feed rod position.

4,203,515
DENTAL CAP PACKAGE

Henry Kahn, 1724 Grand Bahama West, Palm Springs, Calif. 92262, and Sidney M. Libit, Glencoe, Ill., assignors to Henry Kahn, Palm Springs, Calif.

Filed Aug. 10, 1978, Ser. No. 932,510
Int. Cl.[2] B65D *81/00*; A61C *5/08*
U.S. Cl. 206—63.5 3 Claims

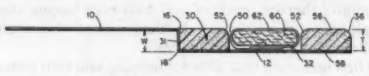


1. A package of cup-shaped shells in various shapes and sizes used in fabrication of dental crowns comprising a base sheet of moldable plastic material having a plurality of said shells in longitudinal and lateral rows protruding from one surface of said sheet in substantially equally-spaced relationships to form a flange around each shell, said shells having walls perpendicular to said sheet and tops of differing dental configurations, the greater portion of the wall periphery of each shell at its juncture with the base sheet being separated therefrom, the remaining portion of said periphery remaining integral with said sheet along a line of weakness for ultimate removal of said shell from its flange, each flange carrying identification indicia for its respective shell and providing a handle for its use after detachment from said sheet.

4,203,516
GREETING CARD

Dorothea E. Stonoga, Norwood, and Virginia K. Flint-Smith, Waltham, both of Mass., assignors to A. Bristol Corporation, Boston, Mass.

Filed Feb. 12, 1979, Ser. No. 11,076
Int. Cl.[2] B65D *85/72*, *81/04*
U.S. Cl. 206—216 3 Claims



1. A greeting card comprising:

a pair of panels integrally formed with a spine section of finite width, said panels being of the same size and forming front and back panels each hingedly joined to the spine along opposite edges thereof,

a relatively rigid protective block having top, bottom and side surfaces and made of a foam material substantially equal in thickness to the width of the spine section and having width and height dimensions substantially equal to the dimensions of the panels, the bottom surface of said block being secured to the front face of the back panel so as to lie between the panels when the panels are closed, and one side surface being secured to the inner face of the spine so that only the hinge joining the front panel to the spine functions as a live hinge,

a well provided in the block extending from the front face thereof,

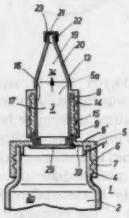
a pet product in the well and covered by a wrapper, the plan view of the well conforming in shape to the shape of the product so that the product is held snugly in the well,

and message bearing indicia relating to the pet for whom the product is designed provided on the front of the front panel.

4,203,517
CONTAINER

Bodo Hildebrandt, Riedstadt; Erich Janele, Hünfeld-Nüst, and Franz Steigerwald, Griesheim, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 965,915
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753737
Int. Cl.[2] B65D *25/08*, *1/04*, *81/32*
U.S. Cl. 206—221 29 Claims



1. A container for accommodating two materials separately from one another and mixing the same, comprising

a first wall bounding a wider chamber for accommodating one material;

a second wall bounding a narrower chamber for accommodating another material;

a connecting sleeve member having one portion which extends in a first direction and is sealingly fitted on said first wall bounding said wider chamber, and another portion which extends in a second direction opposite to said first direction and has an outer thread;

a discharge cap fixedly connected with said second wall and having an inner thread which meshes with said outer thread of the other portion of said connecting sleeve member, said discharge cap being screwed on said other portion and movable relative to the latter;

a separating member having a separating portion arranged to disconnect said chambers from one another, and a projecting portion extending into said narrower chamber and being held by said second wall of the latter so that, when said second wall is withdrawn from said projecting portion of said separating member by unscrewing said discharge cap, said separating member is loosened and said chambers communicate with one another, said projecting portion of said separating member having a predetermined length; and

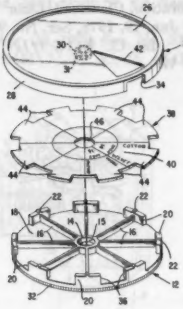
means for retaining said discharge cap on said other portion of said connecting sleeve member during unscrewing of the former, said retaining means including an outer projection which is formed on said second wall in the region adjacent to said wider chamber, and an inner annular groove which is formed in said other portion of said connecting sleeve member also in the region adjacent to said wider diameter and in which said outer projection of said second wall movably engages, said annular groove extending in a direction away from said wider chamber and having a length which is substantially equal to the length of said projecting portion of said separating member.

4,203,518

PACKAGE FOR SEWING MACHINE NEEDLES

Wayne A. Current, Holmdel, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Mar. 9, 1979, Ser. No. 19,064
Int. Cl.[2] B65D *85/24*
U.S. Cl. 206—380 **4 Claims**



1. A storage package for sewing machine needles comprising a circular storage disc having a hub containing an aperture passing therethrough formed at the center of said disc and extending perpendicular to said disc; a plurality of walls defining needle storage compartments rising from said circular storage disc and radiating from said hub; arcuate segments formed at the extremity of each of said walls and rising from said circular storage disc a short distance above said walls for defining an extremity of said needle storage compartments and spaced apart peripherally to define access dispensing openings to each of said compartments; an information disc having information sectors containing written needle information corresponding to the contents of respective compartments, said information disc overlying said needle storage compartments and contracting each of said walls and comprising radiating tabs disposed within said openings and abutting said arcuate segments for restraining said information disc from rotation about said hub so that said information disc remains stationary on said storage disc, said information disc having a thickness not greater than the difference of height of said walls and said segments; a base having a circular surface with a center; a base wall rising perpendicular from said base and encircling said base, said base wall having a dispensing slot formed therethrough for cooperation with said arcuate segments of said needle storage compartments to selectively provide a passageway into and out of a selected one of said needle storage compartments upon rotation of said base; an information aperture on said circular surface of said base for selectively exposing the associated one of said information sectors of said information disc upon rotation of said base to open a selected one of said compartments; and means for securing said base in said aperture in said hub.

4,203,519

TAPE CARTRIDGE HOLDER

Roy K. Fujitaki, Altadena, Calif., assignor to Anthony J. Foto, Pasadena, Calif.

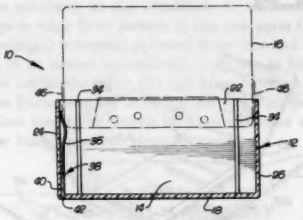
Filed Aug. 15, 1978, Ser. No. 933,962
Int. Cl.[2] B65D *85/672*
U.S. Cl. 206—387 **2 Claims**

1. In a holder for tape cartridges, or the like, the combination of:

(a) a container provided with transverse cartridge compartments respectively having resilient retainers therein along one side of said container and respectively engageable with edges of cartridges in said compartments to retain the cartridges therein;

(b) said retainers comprising integral parts of a retainer assembly which includes a common retainer base from which said retainers project and with which said retainers are integrally formed;

(c) said container having a wall provided adjacent said one side thereof with a slot within which said retainer base is



positioned with said retainers projecting into said compartments along said one side of said container; and

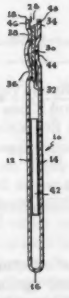
(d) said retainer base in said slot being fixedly secured to said container to support said retainers within said compartments.

4,203,520

RECEPTACLE FOR RECEIVING ARTICLES FOR STORAGE IN STERILIZED CONDITION

Samuel J. Schuster, 617 Vallombrosa, Pasadena, Calif. 91107

Filed Aug. 28, 1978, Ser. No. 937,213
Int. Cl.[2] B65D *33/16*
U.S. Cl. 206—439 **29 Claims**

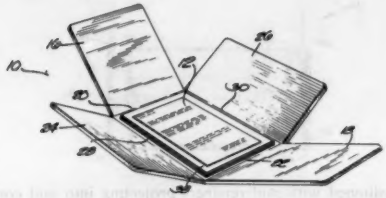


1. A receptacle for receiving articles for storage in sterilized condition, the receptacle being closed except for an opening for inserting the article, the receptacle comprising facing walls of material impermeable to both sterilizing vapor and microorganisms, and a substantially flat membrane impermeable to microorganisms but highly permeable to sterilizing vapor, the membrane being disposed between the facing walls in parallel relationship thereto, a portion of one surface of the membrane being bonded to at least one of the walls, the membrane being operatively associated with the walls to transfer sterilizing vapor to and from the interior of the receptacle along a path that traverses the surfaces of said membrane following insertion of the article and sealing of the opening by bonding a portion of the other side surface of the membrane to the other wall.

4,203,521
PACKET FOR PROVIDING THERMAL PROTECTION FOR DOCUMENTS

Stanley A. Dunn, Madison, Wis., assignor to J. E. Enterprises, Inc., Madison, Wis.

Filed Aug. 9, 1978, Ser. No. 932,192
Int. Cl.[2] B65D 65/40, 85/00
U.S. Cl. 206—525 9 Claims

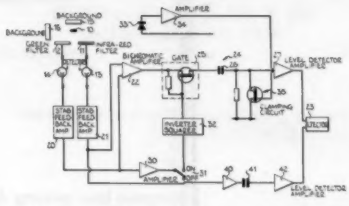


1. A packet containing documents and providing thermal protection for those documents, said packets comprising:
a sacrificial ablative layer comprised of a plurality of layers of paper, and
a metal foil layer enclosing said sacrificial ablative layer shielding the sacrificial ablative layer from surrounding air, said sacrificial ablative layer and said metal foil encasing the documents.

4,203,522
METHOD AND APPARATUS FOR SORTING AGRICULTURAL PRODUCTS

Herbert Fraenkel, London; Patrick B. Gough, Wallington, and William S. Maughan, Burgess Hill, all of England, assignors to Sortex North America, Inc., Lowell, Mich.

Filed Aug. 31, 1978, Ser. No. 938,390
Claims priority, application United Kingdom, Jun. 28, 1978, 28133/78
Int. Cl.[2] B07C 5/342
U.S. Cl. 209—558 12 Claims

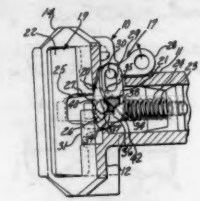


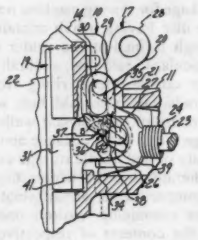
1. A sorting machine for effecting relative separation between desired and undesired agricultural products, the machine comprising first and second detectors which are arranged to receive light from at least one of said products being viewed, said first detector being responsive to light whose wavelength is in a range 6,000 to 15,000 A and the first detector being arranged to produce a first signal, the second detector being responsive to light of a wavelength outside said range and being arranged to produce a second signal, comparator means for comparing the first and second signals and for producing a comparison signal therefrom, separator means for effecting said relative separation, signal transmitting means comprising a gate and a level detector for transmitting the comparison signal from the comparator means to the separator means, and means unaffected by the value of said first signal for supplying to said gate a gating signal which controls the operation of the gate in dependence upon the extent to which the product being viewed is mechanically damaged, whereby the separator means is actuated by comparison signals of a predetermined level only when the extent to which the product is mechanically damaged does not exceed a predetermined value.

4,203,523
LOCKSETTING MECHANISM FOR A RIGID JAW COUPLER

Kenneth L. DePenti, Mayfield Heights, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jun. 19, 1978, Ser. No. 916,475
Int. Cl.[2] B61G 3/12
U.S. Cl. 213—100 W 12 Claims





1. A coupler having a shank extending from a chambered head with a buffing face that connects a pair of laterally spaced fixed jaws, and a locking mechanism which comprises:
(a) a spring biased lock disposed within the chambered head and movable generally longitudinally of the coupler shank between a locked position and a lockset position, the lock having an axially elongated slot therein;
(b) a locklifting lever for moving the lock between the locked and lockset positions, the lever having a pair of opposing ends;
(c) means mounting the lever on the coupler head for limited rotation about an axis which is normal to the longitudinal axis of the coupler shank;
(d) a handle at one of the opposing ends of the lever and disposed exteriorly of the coupler head for operating the lever;
(e) a lug and rocker arm disposed within the chambered head at the other of the opposing ends of the lever, the lug and arm extending in opposite directions from the plane of the lever, the arm being received in the slot of the lock and designed to move the lock axially against the biasing spring, when the handle of the lever is rotated in one direction to operate the lever;
(f) a pawl for frictionally engaging the lug and holding the lock in the lockset position, the pawl having a plate at one end thereof for receipt in an opening disposed in the buffing face of the coupler adjacent the lock, the pawl including a cam for slidably engaging the lug and interlocking coaction with the lug when the lock is moved by the lever to the lockset position, the cam being shaped so that the lug lifts and overrides the cam when the handle is rotated in a direction opposite said one direction, to allow the lock to return to the locked position from the lockset position; and

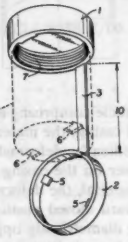
(g) means mounting the pawl for limited movement in a direction which is generally normal to the axial direction in which the lock moves between the locked and lockset positions.

4,203,524

CHILD-PROOF CLOSURE DEVICE

Clarence W. Wieland, 1531 Hyde St. #8, San Francisco, Calif. 94109

Filed Apr. 23, 1979, Ser. No. 32,210
Int. Cl.[2] B65D *55/02, 85/56;* A61D *1/00*
U.S. Cl. 215—216 **16 Claims**



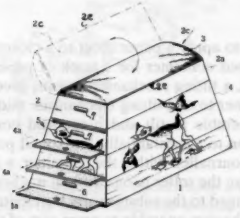
1. An improved closure for a bottle with a bottle cap, said bottle including a bottle bottom and a cap receiving upper lip for mating engagement with said bottle cap, said cap designed to undergo vertical movement towards and away from a sealing disposition on said cap-receiving upper lip, the improvement in said cap comprising: a bottom member for fitting over the bottom of said bottle in releasable snap engagement therewith and configured with respect to said bottle to include means for restraining upward movement of said bottom member relative to said bottle when said bottom member is in place on said bottle bottom; a strap extending between and attached to said bottom member at one portion and said bottle cap at another portion, said strap having a length between said portions long enough to permit said bottom member to be snapped over the bottom of said bottle when said cap is fully seated on said cap-receiving upper lip of said bottle, and short enough to restrain upward excursion of said cap when said bottom member is in place over the bottom of said bottle whereby said cap cannot be removed from said bottle without first removing said bottom member from said bottle bottom.

4,203,525

VAULTING BOX

Yoshikazu Okubo, 837-1 Hachigasaki, Matsudo-shi, Chiba-ken, Japan

Filed Jun. 29, 1977, Ser. No. 811,436
Claims priority, application Japan, Dec. 9, 1976, 51/164101[U]
Int. Cl.[2] B65D *21/02;* A63B *5/12*
U.S. Cl. 220—4 C **11 Claims**



1. A box-like structure comprising a bottom frame member, a top frame member, and at least one intermediate member, each of said frame members having, a plurality of sides inclined inwardly to the vertical defining a truncated pyramid shape of successively reduced size in height, length and width, the upper edge of each frame members having a pyramidal dimension conforming to the pyramidal dimension of the lower edge of the next successive frame member of reduced size enabling said frame members, in one condition, to be stacked successively edge to edge from bottom to top one upon the other to form an enlarged truncated pyramid shape box and in a second condition to be nested successively from top to bottom completely one within the other, the top frame having a cover, and the bottom frame member having a slot in a wall thereof and a closure plate insertable therein to form a bottom wall for retaining the frame members nested therein.

4,203,526

PLASTIC DRUM ASSEMBLY

Andrew J. Stoll, III, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 636,264, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 635,206, Nov. 25, 1975, abandoned. This application Feb. 22, 1978, Ser. No. 879,841
Int. Cl.[3] B65D *1/46, 6/34, 25/22*
U.S. Cl. 220—71 **11 Claims**

1. A plastic drum assembly comprising a single-piece molded plastic drum having a top end, a bottom end, and a circumferential sidewall merging with said top and bottom ends, said sidewall including a circumferential recess adjacent said top end, said recess having an upper flat ledge portion facing downwardly and disposed essentially perpendicularly to the longitudinal axis of said drum, and a removable circumferentially disposed split metal collar mounted on said drum, said metal collar having a substantially circumferential inwardly extending projection adjacent its lower margin positioned within and engaging said circumferential recess, said inwardly extending projection including a flat shoulder surface disposed in snug contact with said flat ledge of said recess, said metal collar having an annular bead disposed adjacent the top thereof, whereby said metal collar is grippable by steel drum chime-handling devices enabling lifting and transportation of said drum assembly.

4,203,527

NOVEL SECURE CAP WITH DEPRESSIBLE LOCK

Ernest J. LaChance, Sr., Old Wilton Rd., Milford, N.H. 03055

Filed Apr. 6, 1978, Ser. No. 896,078
Int. Cl.[2] B65D *51/18*
U.S. Cl. 220—253 **10 Claims**

1. A secure closure of the type useful on pill containers, said closure comprising

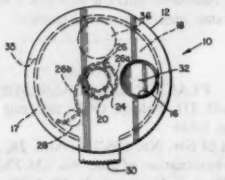
a top external closure member and a lower internal closure

member which are mounted for vertical and rotational movement relative to one another and which, together, form lock means;

apertures in each of said top and lower members which are positioned to be brought into register by rotation, and to form a pill dispensing port;

biasing means to hold said closure members in a first, normally-closed, position with said apertures maintained in non-registered position

lever means on said internal member forming means to rotate said internal members into a dispensing position, said lever means extending through a slot in said external



member, which slot forms a path in which said lever means is moveable,

said lock means comprising a projection on said internal member and a receptacle for said projection on said external member, which lock means forms means to lock said members against rotational movement, said lock means being releasable in response to depression of said projection

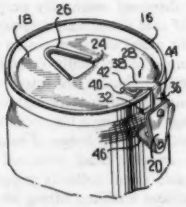
biasing member forming means to return automatically said internal member and said external member to said normally closed rotational position and to return said internal member and said external member to a locked vertical position.

4,203,528

SELF-STORING PULL STRIP FOR EASY OPENING CONTAINERS

Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,327
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 **10 Claims**



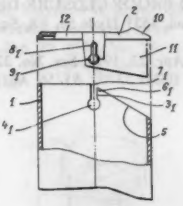
1. A pull strip for use in an easy opening container having a removable panel portion, said pull strip comprising an elongated strap portion, a securing portion and a grip portion; said strip portion being narrower than said securing portion and being divided into a terminal anchoring part, an intermediate part and an extension part by transverse hinge means each having a memory automatically operable to effect a folding of said parts of said strip portion from a planar state towards reversely folded portions.

4,203,529

POURING RECEPTACLE WITH AUTOMATIC CLOSURE

Jean F. Torassa, and Gerard Torassa, both of Les Residences du mont Boron 31 avenue de Mont Boron, 06300 Nice, France

Filed Oct. 11, 1978, Ser. No. 950,396
Int. Cl.[2] B65D *43/14, 51/04*
U.S. Cl. 220—337 **9 Claims**



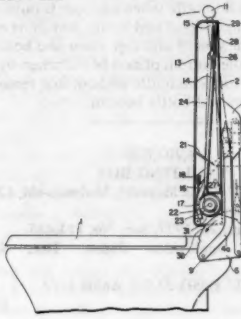
1. A pouring receptacle comprising a casing, a cover swingably mounted on said casing, the material of one of the cover and casing being resiliently deformable whereby swinging movement of the cover on the casing to open position resiliently deforms said material, the deformed material resiliently urging the cover toward closed position, the casing opening upwardly and having diametrically opposed slots adjacent its upper end, the cover having diametrically opposed lugs that rest in said slots in the closed position of the cover, whereby upon swinging movement of the cover to open position, said material is resiliently deformed by pressure of the lugs against the side walls of the slots.

4,203,530

DEVICE TO APPLY A PAPER SHEET TO A CLOSET SEAT

Gerardus M. Tromp, The Hague, Netherlands

Filed Mar. 14, 1978, Ser. No. 886,600
Claims priority, application Netherlands, Dec. 23, 1977, 7714364
Int. Cl.[2] A47K *13/14*
U.S. Cl. 221—186 **10 Claims**



1. A device to apply a paper sheet to a closet seat, comprising a box-shaped container for a stack of paper sheets fitting the closet seat, a tilting mechanism, means pivotally connecting said container to said tilting mechanism, said tilting mechanism being operable to tilt and hinge said container from a vertical position to a substantially horizontal position, a paper driving roller journalled within the container, a driving mechanism for rotating the roller in one direction when the container is tilted and hinged to the substantially horizontal position, and a pressing mechanism operable to press part of the paper stock on to the paper driving roller, whereby when the container is tilted and hinged from a substantially vertical to a substantially horizontal position, the roller is made to rotate and convey a

single paper sheet longitudinally off the stack through an opening in the container.

4,203,531

ULTRASONIC SOLDERING BATH HAVING AN ULTRASONIC PROBE EXTENDING INTO THE SOLDER BATH

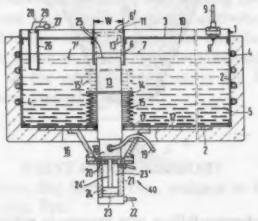
Hilmar Reichel, Planegg; Guenter Klauke; Karl-Heinz Herting, both of Munich, and Martin Pointner, Kirchseeon, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,791

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728634

Int. Cl.[2] B23K *1/06*

U.S. Cl. 228—1 A **8 Claims**



1. In an ultrasonic soldering device having a container to hold a bath of molten solder, an ultrasonic transducer for creating ultrasonic waves, a probe being connected to the transducer and having a sound emitting surface, and means for mounting the probe to extend through a wall of the container with the emitting surface being disposed in the bath, the improvements comprising the container being hermetically sealed at the top by a lid provided with a shaft extending therethrough, said device having means for applying pressure on the surface of the bath of solder material so that the level of the solder in the shaft can be changed, said means for mounting positioning the probe to extend through a bottom wall of the container with the probe being aligned with said shaft and including means for changing the amount of the probe extending into the bath so that the position of the sound emitting surface of the probe in the bath can be changed to be at different heights in said shaft.

4,203,532

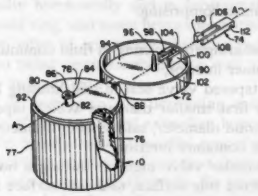
SAFETY CONTAINERS

Bob Mar, Stockton, Calif.

Division of Ser. No. 909,332, May 25, 1978, Pat. No. 4,146,146. This application Mar. 19, 1979, Ser. No. 22,016

Int. Cl.[2] B65D *5/32, 55/02, 25/42*

U.S. Cl. 222—153 **4 Claims**



1. A safety cap for dispensing liquids from a container having a mouth and a lip surrounding the mouth, the safety cap comprising:

a stopper seat sized to fit over the mouth of the container and having a passage extending through it;

a stopper sized to fit over the stopper seat and having an upper side, an under side, and a neck adapted to rest against the stopper seat, the neck having a recess extending through it, the stopper further having a slide channel extending across its underside and aligned with the recess;

hinge means for connecting the stopper to the stopper seat so that the stopper can be swung from a closed position in which the neck rests against the stopper seat to an open position;

a spout aligned with the slide channel and projecting upwardly from the stopper seat, the spout having a tubular portion, a flange at the upper end of the tubular portion, and a passage extending through the tubular portion and flange which communicates with the passage extending through the stopper seat;

a plug extending from the under side of the stopper, the plug adapted and aligned so that will project into and seal the passage extending through the tubular portion and flange when the stopper is swung to its closed position; and

a pin slidable in the recess and the slide channel from an inserted position to an extended position, the pin havng an outer portion and an inner portion, the inner portion including two spaced apart legs which extend on opposite sides of the plug, the legs extending on opposite sides of the tubular portion when the stopper is in its closed position and the pin is slid to its inserted position so that the flange will engage the pin and prevent the stopper from being swung to its open position.

4,203,533

TONER POWDER SUPPLY SYSTEM

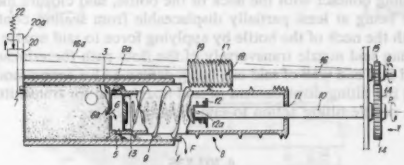
Karl G. Zeuthen, Gentofte, Denmark, assignor to Rex-Rotary International/A.S., Birkerod, Denmark

Filed Feb. 2, 1978, Ser. No. 874,393

Claims priority, application United Kingdom, Apr. 14, 1977, 15625/77

Int. Cl.[2] G01F *11/24*

U.S. Cl. 222—241 **22 Claims**



1. In a dry toner developer unit in a photocopier, for metering toner from a toner supply container, the improvement wherein said supply container is a cylindrical canister and has a toner extractor member axially movably and rotatably mounted therein; and wherein said developer unit further includes:

(a) a cylindrical drive rotor;

(b) means driving said drive rotor for rotation about an axis and for movement along said axis;

(c) a screw flight on the exterior of said drive rotor;

(d) abutment means on one end of the drive rotor for drivably engaging the toner extractor member of said canister to drive it for rotation around, and for axial movement along, said axis;

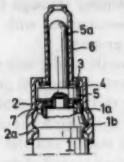
(e) and means for holding said canister against rotation coaxially around said axis of the drive rotor.

4,203,534

TILTING NOZZLE CLOSURE WITH DUAL SEALING SURFACES

Klaus W. Finke, Finnentrop, Fed. Rep. of Germany, assignor to Robert Finke Kunststoff-Spritzguss-Werk, Finnentrop, Fed. Rep. of Germany

Filed Aug. 17, 1978, Ser. No. 934,386
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738243
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.13 10 Claims



1. A tilting nozzle closure for attachment to the neck of a bottle which forms an outlet from the bottle, comprising a cap formed of a plastics material, said cap having an axially extending annular side wall arranged to extend downwardly around the neck of the bottle and an end wall extending transversely of the axial direction of and across said side wall, a tubular nozzle secured to and extending from said end wall in the opposite direction from said side wall, said side wall having an annular bead on the inner surface thereof and said annular bead arranged to fit downwardly over and in bearing contact with a similar bead on the neck of the bottle, at least a part of said end wall being more resilient than said side wall, and a closure member located within said cap having a first surface arranged to contact the end surface of the neck of the bottle and a second surface projecting in the axial direction of said side wall from said first surface and arranged to fit into and seal the inner surface in the neck of the bottle, said first and second surfaces arranged to form sealing surfaces with the neck of the bottle, said annular bead on said side wall being spaced from said end wall of said cap so that upon attachment of said cap onto the bottle the interengagement of said annular bead with the similar bead on the bottle stresses said side wall in the axial direction and pulls said end wall toward the neck of the bottle to bias said first and second surfaces on said closure member into sealing contact with the neck of the bottle, said closure member being at least partially displaceable from sealing contact with the neck of the bottle by applying force to said nozzle for tilting said nozzle transversely of the flow path therethrough, and said end wall of said cap being deformed for accommodating the tilting displacement of said nozzle and for transmitting the nozzle tilting action to said closure member.

4,203,535

METHOD AND APPARATUS FOR LOW-DUST DISCHARGE OF PARTICULATE MATERIAL THROUGH A NOZZLE

William C. Burnett, 6229 Malloch Dr., Memphis, Tenn. 38138, and John D. Adams, Memphis, Tenn., assignors to William C. Burnett, Memphis, Tenn.

Filed Sep. 12, 1978, Ser. No. 941,382
Int. Cl.[2] G01F *11/20*
U.S. Cl. 222—411 18 Claims

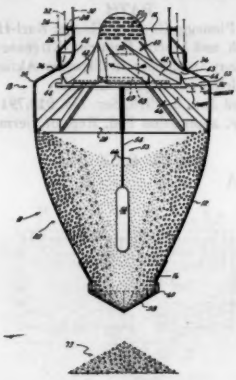
1. A method of discharging particulate material containing heavier and lighter particles, comprising the steps of:

feeding said material as a downwardly moving stream through the inlet of a nozzle,

deflecting said particles outwardly within said nozzle into an annular space, the heavier particles upon such deflection having greater outward momentum than the lighter, finer particles, thereby classifying the stream inside the nozzle with the lighter particles concentrated toward the center and the heavier particles concentrated toward the wall of the nozzle,

accumulating a quantity of the thus classified mass in said nozzle, and

releasing said mass from said nozzle at the bottom thereof,



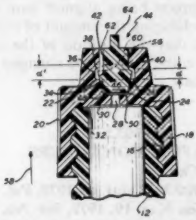
the released mass falling as a stream in which the heavier particles toward the outside curtain the lighter particles toward the center and thereby reduce escape of said lighter particles as dust.

4,203,536

DISPENSING CLOSURE FOR A SQUEEZABLE CONTAINER

William M. Lester, 8 Brayton Rd., Livingston, N.J. 07039

Filed Sep. 11, 1978, Ser. No. 941,142
Int. Cl.[2] B67D *3/00*; B65D *83/14*
U.S. Cl. 222—495 9 Claims



1. A closure for dispensing a fluid stored in a squeezable resilient container comprising:

a housing,

means for securing the housing in fluid communication with the container interior,

an annular tapered valve seat in said housing having a surface at a first smaller diameter which tapers toward a larger second diameter, said smaller diameter being closest to said container interior,

a tapered annular valve member having a bottom surface and a tapered side surface, said side surface complementing said valve seat for providing a substantially fluid tight seal when seated in the closed valve position and for providing a fluid passage at the interface between said member side surface and said seat when in the open valve position, a side of said member opposite said bottom surface being coupled to the ambient,

said bottom surface and said interface being positioned in

fluid communication with said stored fluid so that fluid forced against said bottom surface displaces said member to the open valve position and said fluid enters into said interface in an annular continuous ring,

fluid discharge conduit means in fluid communication with and between said interface and the ambient, and

valve member displacement limiting means connected to said housing for limiting the distance said member is permitted to displace from the closed valve position to the open valve position to provide a maximum clearance between said side surface and said seat at that value at which fluid in said interface tends to effectively seal said interface from ambient air when the container interior pressure is less than ambient pressure such that the pressure differential is sufficient to force said valve member to its closed valve position,

said member having a shoulder, said housing having a chamber adjacent said larger diameter, said shoulder being positioned within said chamber, said chamber having an upper wall which abuts said shoulder when said member is displaced to the open valve position for forming said displacement limiting means.

4,203,537

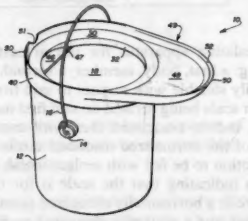
PAINT CAN ACCESSORY

George McAlister, Big Spring, Tex., assignor to Plastic-Craft, Inc., Big Spring, Tex.

Continuation of Ser. No. 827,577, Aug. 25, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,410

Int. Cl.[2] B65D *25/40*

U.S. Cl. 222—570 **10 Claims**



1. A paint can accessory adapted to be removably mounted on the annular rim of a paint can to prevent paint from flowing into the rim channel thereof, comprising:

an annular ring disposed over the rim channel of the paint can, said ring having an outer skirt depending therefrom extending around the outer periphery of the can and an inner skirt depending therefrom extending around the inner periphery of the can;

a pouring spout for pouring paint from the can extending substantially horizontally and in substantially the radial plane of said ring, said spout being substantially planar and having an edge of constantly changing radius, and said spout also being circumscribed by a wall extending substantially around said ring; and

a plurality of leveraging ribs depending axially from the underside of said spout and extending laterally from said outer skirt in substantially parallel spaced apart relation for transmitting leveraging force to a sector of said ring, said ribs being spaced sufficiently far apart and having sufficient axial depth so that the fingers of the hand contact the underside of said spout in the channels formed between said ribs when leveraging force is applied to remove the accessory from the can, the ribs varying in length relative to their lateral dimension to correspond with the changing radius of the spout with the ribs being shorter adjacent the lateral edges of the spout.

4,203,538

REFRACTORY SPOUT BRICK

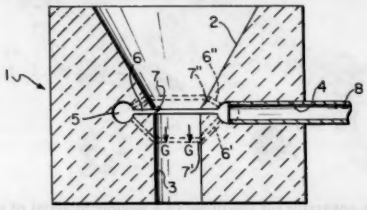
Ernst Lührsen, Bad Schwalbach, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,427

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731113

Int. Cl.[2] B22D *41/08*

U.S. Cl. 222—603 **14 Claims**



1. A refractory spout brick comprising:

a block of refractory material having extending therethrough a throughflow opening;

an annular gas collecting space within said block at a position surrounding said throughflow opening radially outwardly thereof;

a gas feed duct extending through said block from the exterior thereof, to said gas collecting space; and

at least one annular duct extending radially inwardly from said gas collecting space to said throughflow opening, said at least one annular duct opening into and forming with said throughflow opening at least one slit which extends around the entire periphery of said throughflow opening.

4,203,539

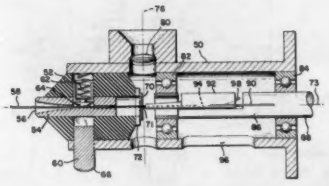
METHOD AND APPARATUS FOR CUTTING OPTICAL FIBERS

Glen E. Miller, Redondo, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 23, 1978, Ser. No. 953,996

Int. Cl.[2] B26F *3/00*

U.S. Cl. 225—2 **5 Claims**



2. A method for cutting an optical fiber along a plane perpendicular to the fiber axis, comprising the steps of:

(a) clamping a fiber at a first location;

(b) retaining the fiber at a third location spaced from the first location;

(c) moving the fiber at a third location in a spiraling path;

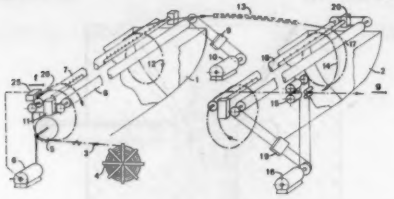
(d) scribing the fiber circumferentially at a second location along a plane perpendicular to the fiber axis at the second location by continuing the spiraling movement; and

(e) breaking the fiber by progressively bending and fracturing the fiber about the circumferentially applied scribe at the second location by continuing the spiraling movement.

4,203,540
APPARATUS AND METHOD FOR TREATMENT OF ELONGATED FLEXIBLE MATERIAL

Marcel Giros, Route de Saint-Dizier, Ancerville, France (55170)

Filed Sep. 11, 1978, Ser. No. 941,187
Claims priority, application France, Sep. 22, 1977, 77 29100
Int. Cl.[2] B65H 17/42
U.S. Cl. 226—119 7 Claims

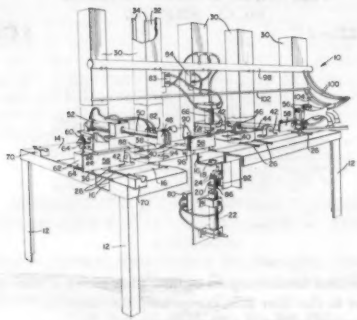


1. An apparatus for treatment of a flexible material of great length in a treatment volume, comprising means for giving the material the form of a helix comprising several turns, means for causing this helix to progress or advance in the treatment volume by being driven by rotating supporting shafts and means for regulating the speed of entry of the material into the volume and also its speed of progression the treatment volume comprising at least two treatment chambers disposed side-by-side, the entry of the material into one chamber being substantially opposite the exit of the material from the following chamber, and means appropriate for guiding the material from one chamber to the following chamber without driving the said material, wherein said means for guiding said material are formed of a tunnel equipped with two trains of idler rollers.

4,203,541
AFFIXING CUSHIONING PADS TO FLOOR SLEEPERS

Robert U. Gravitter, Houghton, and William O. Isaacson, Laurium, both of Mich., assignors to Horner Flooring Company, Dollar Bay, Mich.

Filed Apr. 13, 1978, Ser. No. 896,213
Int. Cl.[2] B27F 7/02
U.S. Cl. 227—40 12 Claims



1. Apparatus for affixing pads spaced along the length of a floor sleeper comprising:

positioning means to hold a sleeper in a working position for affixation of a plurality of pads spaced along the sleeper including spaced parallel wall means to retain the sleeper along both of its sides to retain it against lateral displacement during pad affixation and lifting means disposed to raise the sleeper from a remote position between said wall means into said working position;

a series of magazines spaced along the length of said positioning means with each magazine adapted to hold a stack of pads;

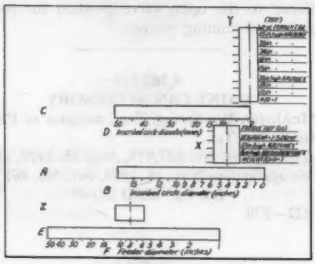
means associated with each magazine operable to place a pad from the magazine at a predetermined location relative to a sleeper held in said working position by said positioning means; and

pad affixing means mounted in operative relation to each said location for affixing the pad to the sleeper at each said location.

4,203,542
CALCULATING APPARATUS

Clifford F. Corbett, Tipton, England, assignor to Foseco International Limited, Birmingham, England

Filed Oct. 3, 1977, Ser. No. 838,981
Claims priority, application United Kingdom, Oct. 1, 1976, 40895/76
Int. Cl.[2] G06C 3/00
U.S. Cl. 235—85 R 1 Claim



1. Calculating apparatus for use in casting molten metal comprising: a first, body, member; a second, slidable, member, horizontally slidable with respect to said first body member; a first, linear scale being formed on said first member, and having numerical indicia associated therewith corresponding to the diameter of the normalized inscribed circle associated with a casting section to be fed with molten metal, and word character indicia indicating that the scale is for the normalized inscribed circle; a horizontally elongated opening formed in said first member, and a vertically elongated opening formed in said first member; said first scale being disposed along said first horizontally elongated opening formed in said first member; a second, linear, scale having numerical indicia associated therewith corresponding to a feeder head parameter and word character indicia indicating the feeder head parameter, said second scale being formed on said second member; the numerical indicia of said first and second scales being in the same units, with the numerical indicia of the second scale spaced apart a distance greater than the numerical indicia of said first scale are spaced apart; a third, logarithmic, scale having numerical indicia associated therewith corresponding to the casting section weight or volume, and word character indicia indicating that the scale is for casting section weight or volume, said third scale being formed on said second member; said first, second, and third scales being disposed in physical proximity with each other so that they are correlated, the correlated numerical value associated with one of the scales being readily determinable if the numerical value associated with the other two scales is known; a plurality of indicia markings provided along said vertically elongated opening, each indicating a different feeder head parameter; said second and third scales being parallel on said second member, and said second scale positioned so that it is readable through said vertically elongated opening and is adjacent to an indicia marking of said vertically elongated opening indicating a feeder head parameter; a plurality of other scales on said second member parallel to the said second scale, and each cooperating with a said corresponding indicia marking provided along said vertically

elongated opening; second and third horizontally elongated openings formed in said first member, and three additional scales corresponding to weight of metal in the feeder, feeder height, and feeder diameter, respectively, formed and positioned on said first and second members and associated with said second and third horizontally elongated openings, said second horizontally elongated opening having one of said feeder height and said feeder diameter scales formed therealong and the third of said horizontally elongated openings being centrally located with respect to, and vertically spaced from, said second horizontally elongated opening; and said scale corresponding to weight of metal in the feeder extending horizontally and being disposed on said second member so that it is visible through said third horizontally elongated opening, and said scale corresponding to the other of said feeder height and said feeder diameter extending horizontally and being disposed on said second member so that it is visible through said second of said horizontally elongated openings.

4,203,543

PATTERN GENERATION SYSTEM

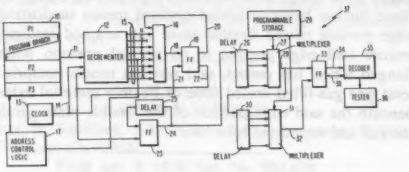
Dieter Staiger, Weil im Schonbuch, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1978, Ser. No. 930,947

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 2746743

Int. Cl.[2] G06F *1/04, 11/00*

U.S. Cl. 371—24 **9 Claims**



1. A pattern generator for supplying a series of pulses of varying time periods without transient switching times between the pulses comprising:

a memory,

said memory storing programmed sequences of pulse cycle times, each of said sequences having a respective cycle time,

a clock,

an address control logic circuit,

a decoder,

a tester coupled to said decoder, and

programmable cycle timer means having inputs coupled to said clock and said memory and outputs coupled to said address control logic circuit and said decoder for determining prior to the end of each pulse cycle time in a sequence if a different pulse cycle time is required, and for loading the next programmed pulse cycle time prior to the end of the present cycle time so that upon termination of the present cycle time the next pulse cycle time will be introduced into the tester without any transient switching period between said cycle times.

4,203,544

METHOD FOR IDENTIFICATION OF CODED LABELS

Jean L. Guilgue, Vendome, France, assignor to Metalimphy, Paris, France

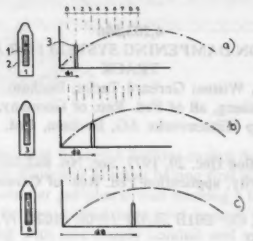
Filed Feb. 13, 1978, Ser. No. 877,384

Claims priority, application France, Mar. 25, 1977, 77 09110

Int. Cl.[2] G06K *7/08, 19/06*

U.S. Cl. 235—449 **2 Claims**

1. In a method for identifying an article provided with a numerically coded magnetic member, comprising the steps of creating a detection zone by supplying an exciter coil with an exciting alternating current, passing the article provided with the coded magnetic member through the detection zone whereby to derive at least one signal from the coded magnetic member, and detecting said at least one signal derived from the coded magnetic member using a detector coil whereby to determine the code of the magnetic member; the improvement comprising the steps of providing the magnetic member with at least one of plurality of elements made of magnetic alloys each having a different hysteresis loop, assigning a code value to each type of alloy, successively detecting the elements as



they pass through said detection zone, and decoding the numerical code value of each of the elements by measuring the phase shift of the signal derived using the detector coil relative to the phase of the exciting alternating current, said phase shift being indicative of the type of alloy and of the code value assigned thereto, the number (A) of said elements of magnetic material and the number (B) of different alloys establishing said code of the magnetic member from B^A possibilities, the position of the numerical code value of each element in the number code being determined by the order in which the elements are successively detected in the detection zone.

4,203,545

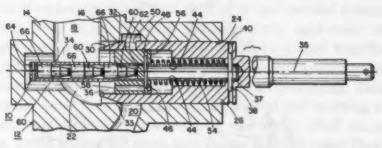
THERMOSTATICALLY RESPONSIVE VALVE MECHANISM

Kenneth C. Fackler, Gibson City, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Aug. 7, 1978, Ser. No. 931,487

Int. Cl.[2] G05D *23/12*

U.S. Cl. 236—93 A **5 Claims**



1. In a valve assembly having a valve seat defining a fluid flow passage with an inlet and an outlet to the passage on opposite sides of the seat and a valve member cooperative with the valve seat to regulate fluid flow through the passage, the improvement of a temperature responsive valve member bypass mechanism comprising in combination:

a bypass channel defining a piston chamber in the valve member, said channel connecting the inlet to the outlet and bypassing the valve seat;

a piston slidably mounted in the piston chamber and translatable between closed position in which the bypass channel is closed and an open position in which the bypass channel is open;

means for biasing the piston in a first direction to normally maintain the channel in the closed position;

a heat transmissive probe projecting into the path of fluid flow through the valve assembly on the downstream side

of the valve seat, said probe including thermostatically responsive, expansible means in contact with the piston and expandable in the opposite direction to the first direction whereby the thermostatically responsive, expansible means expand in response to a threshold temperature to translate the piston to the open position whereby fluid flows through the bypass channel.

4,203,546

OSCILLATION DAMPENING SYSTEM FOR A RAILWAY TRACK

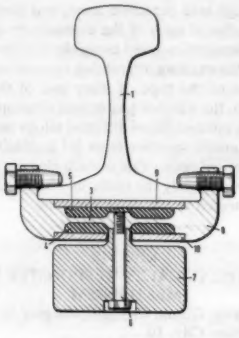
Erwin Raquet, Witten; Gerhard Tacke, Bochum, and Wilhelm Heller, Duisburg, all of Fed. Rep. of Germany, assignors to Fried. Krupp Hüttenwerke AG, Bochum, Fed. Rep. of Germany

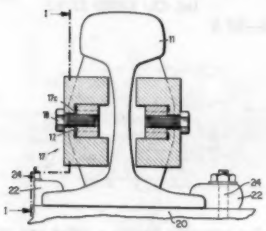
Filed Dec. 20, 1977, Ser. No. 862,331

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657860

Int. Cl.[2] E01B *26/00, 19/00;* **H02G** *7/14*

U.S. Cl. 238—1 **19 Claims**





1. In a system for dampening the oscillations of a rail, in which said rail is supported on a railway bed, said rail being incited to oscillate by a wheel running over said rail, and including masses attached to said rail distributed over the length thereof to dampen said oscillations, the improvement comprising:

an oscillating system coupled to said rail,

said rail having a characteristic frequency, and

said oscillating system being tuned to the characteristic frequency of said rail and including a mass, spring means and dampeners

said spring means connected at the ends thereof to said rail and at a location between said ends to said mass, said spring means including means for receiving said dampeners.

4,203,547

RAILWAY LEVEL CROSSING

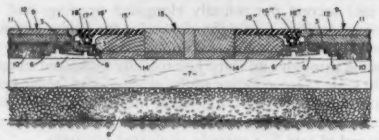
Pieter A. van der Harst, IJmuiden, Netherlands, assignor to Hoogovens IJmuiden, B.V., IJmuiden, Netherlands

Filed Mar. 15, 1978, Ser. No. 886,835

Claims priority, application Netherlands, Mar. 22, 1977, 7703072

Int. Cl.[2] E01C *9/04*

U.S. Cl. 238—8 **4 Claims**



1. A railway level crossing comprising two spaced apart rails constituting the rail track at the crossing and a road surface between the rails substantially at the level of the top surfaces of the rails, wherein an unyielding bed is provided between the rails and, at least adjacent each of the rails, the said road surface between the rails being provided with at least one flexible plate which is supported by said unyielding bed and has an edge portion extending to closely adjacent the rail, said edge portion not being directly supported by said unyielding bed whereby said edge portion can bend downwardly when engaged by a flange of a flanged wheel passing along the rail, there further being provided resilient means supporting said edge portion of the flexible plate and adapted resiliently to restore said edge portion to its normal position when the flanged wheel has passed, said resilient means comprising at least one gas-filled sealed tube of flexible material extending beneath the said edge portion of the flexible plate parallel to the rail and supported by a base.

4,203,548

MODEL TRACK SECTION

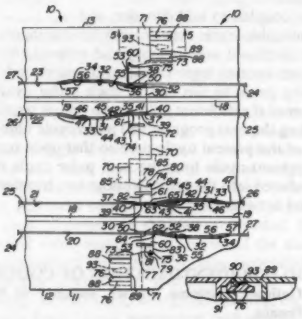
Richard C. M. Cheng, Suite 1604, Austin Center, Austin Ave., Kowloon, Hong Kong (B.C.C.)

Continuation-in-part of Ser. No. 717,581, Aug. 25, 1976, Pat. No. 4,084,746. This application Sep. 8, 1977, Ser. No. 831,377

The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.

Int. Cl.[2] A63H *19/30*

U.S. Cl. 238—10 F **3 Claims**



1. A track section for a model vehicle, said track section comprising a generally flat longitudinally elongate body having an upper vehicle supporting surface, a first formation on each end of said body having one side facing generally laterally, resilient means on said one side of each first formation disposed oblique to said body and deflectable laterally toward

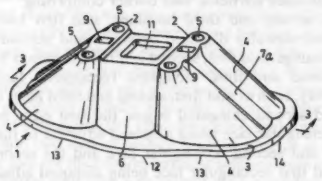
the associated first formation, a complementary formation on each end of said body configured to cooperate with the one side of the first formation of a like track section for deflectable engagement with said resilient means upon longitudinally aligned relative movement between said first mentioned and like track sections, guide means on each end of said body for guiding engagement with like guide means of the like track section to constrain the first mentioned and like track sections to longitudinally aligned relative movement, and releasably interengageable retaining means on each end of said body for interfitting engagement with like retaining means of the like track section, said first formations each having its other side facing generally laterally, additional resilient means on said other side of each first formation disposed oblique to said body and deflectable laterally toward the associated first formation, and an additional complementary formation on each end of said body configured to cooperate with the other side of the first formation of a like track section for deflectable engagement with said additional resilient means upon longitudinally aligned relative movement between said first mentioned and like track sections, said upper body surface being formed with a pair of continuous upwardly facing grooves each having one end opening along a respective side of said first formation and its other end opening along a respective one of said first mentioned and additional complementary formations, and said first mentioned and additional resilient means each comprising an integral continuous conductive strip received in a respective groove with its opposite ends extending beyond the opposite ends of the receiving groove for respective engagement with the like strips of a like track section, said grooves being sufficiently straight to receive said strips without permanently deforming the latter.

4,203,549

RAILWAY SLEEPER

Geoffrey P. Sandford, 2-8/10 Brand St., Artarmon, Sydney NSW, Australia (2064)

Filed Apr. 4, 1978, Ser. No. 893,608
Claims priority, application Australia, Apr. 7, 1977, PC 9710
Int. Cl.[2] E01B *3/20*
U.S. Cl. 238—111 **2 Claims**



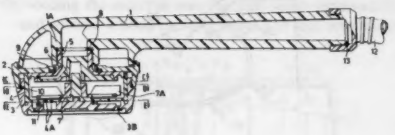
1. A unitary railway sleeper component comprising, an elongated base which is considerably longer than it is wide, a body on the upper surface of the base, a flange portion of the base surrounding and extending beyond the body, an undulating undersurface on the base made up of crests and valleys in the width direction of the base, two pairs of grout cavities extending into the body from the base, the cavities of each pair being aligned in the width direction of the base, two fastening cavities respectively disposed between the cavities of each pair of grout cavities, the pairs of grout cavities being located one pair adjacent each end of the base, a box cavity separating the pairs of grout cavities, openings in the top of the body respectively communicating with the body cavities, a depressed region in the top of the body extending in the width direction of the base to provide two spaced apart raised lands, three openings in each land communicating respectively with a pair of grout cavities and the fastening cavity therebetween, said grout cavities decreasing in cross-section from the base to the body top.

4,203,550

SHOWER HEADS

Lo Hou On, Kowloon, Hong Kong, assignor to Hexagear Industries Limited, Shaukiwan, Hong Kong

Filed Dec. 5, 1977, Ser. No. 857,698
Claims priority, application United Kingdom, Dec. 6, 1976, 50781/76
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—102 **1 Claim**



1. A shower head having a hollow casing defining a fluid supply conduit; a circular housing having first and second end walls and an annular peripheral wall forming a fluid chamber; said housing having a fluid inlet port in said first end wall communicating with said supply conduit and secured to said casing; a rotor rotatably mounted in said chamber; said rotor having vanes thereon for impelling said rotor from fluid moving through said chamber; said second end wall having first fluid discharge openings therethrough arranged in circumferentially spaced groups and second fluid discharge openings circumferentially spaced from said first openings; said rotor having a base panel adjacent and generally parallel to said second end wall; said base panel having an opening therethrough arranged radially to overlap both said first and second discharge openings; an outer shell having inner and outer portions, the outer portion being cup-like and rotatable about said housing and having a front panel equipped with circumferentially spaced radially inner openings and a plurality of radially outer openings; said inner openings being radially aligned with said openings in said second end wall; means on the inner face of said front panel surrounding each of said inner openings and forming a seal therearound to create a fluid passageway between said inner openings and said first openings in said base panel when said shell is in one circumferential position and to close said first openings when said shell is in a second circumferential position; a chamber between said front panel and said second end wall surrounding said means and forming a chamber communicating with said radially outer openings and with said second openings when said shell is in said second position to redirect fluid to said second openings only; said outer and inner portions of said shell being threadedly joined together; means providing a liquid tight seal between said portions; said inner portion having a radially inwardly extending flange adjacent the inner face of said first end wall of said housing and providing said rotatable mounting of said outer shell on said housing; a seal seated between said flange and the inner face of said first end wall; said outer and inner portions entirely enclosing said housing and providing a circular grip for adjusting the operational characteristics of said shower head.

4,203,551

APPARATUS FOR PRODUCING A PULSATING SPRAY OF WATER

Stewart A. Levine, 30-1 Farm Rd., Somerville, N.J. 08876

Filed Aug. 31, 1978, Ser. No. 938,633
Int. Cl.[2] B65N *75/00*
U.S. Cl. 239—195 **4 Claims**

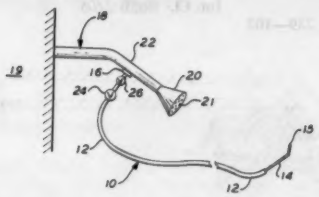
1. Apparatus for producing a pulsating spray of water for lavaging of body orifices, said apparatus for being connected to a water supply system for providing a normal flow of water therethrough, comprising:

a tip;

a flexible tube one end of said tube connected to said tip and

said tube for communicating water from said water supply system to said tip;

connecting means connected to the other end of said flexible tube and for interconnecting said flexible tube to said water supply system so as to simultaneously allow said



normal flow of water through said supply system and a flow of water through said flexible tube and out of said tip; and

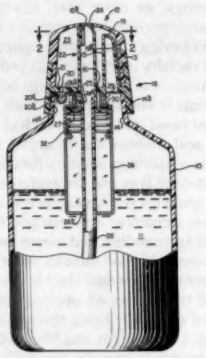
pulsating means positioned intermediate said connecting means and said tip and for pulsating said water communicated through said flexible tube and out of said tip.

4,203,552

PRESSURIZED ATOMIZER

Thomas H. Hayes, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 5, 1978, Ser. No. 939,276
Int. Cl.[2] B05B *3/10*
U.S. Cl. 239—337 **15 Claims**



1. An apparatus for dispensing liquids, comprising:

a. container means for storing said liquids;

b. closure means connectable to said container means, said closure means having a floor means defining an upper chamber means between the interior of cap means and said floor means, said floor means having a hole therein for allowing liquids contained in said upper chamber means to drain downwardly into said container means;

c. gas reservoir means connected to said closure means for supplying gas under pressure to the interior of said container;

d. dip tube means for conveying liquid from said container to said stem means;

e. cap means connected to said closure means, said cap means having first orifice means therein;

f. film forming means connected to said floor of said closure means, said film forming means comprising post means having second orifice means therein alignable with said first orifice means, said post means having a hollow chamber therein which communicates with the interior of said container through said floor of said closure; and,

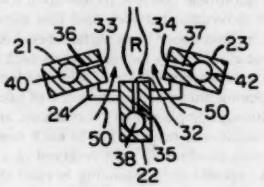
g. stem means slidably connected to said gas reservoir means for controlling the flow of gas from said reservoir, said stem means having third orifice means therein for directing liquids onto said post means, said stem means extending through said floor means and into said chamber means.

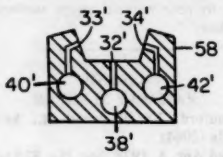
4,203,553

RIBBON BURNER

David L. Bachman, Lindley, and Peter P. Bihuniak, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,055
Int. Cl.[2] F23D *13/40, 15/00*
U.S. Cl. 239—420 **9 Claims**





1. A burner for producing a flame in which a metal halide vapor undergoes a chemical reaction resulting in the formation of metal oxide particles, said burner comprising

first, second and third housings, said first housing being symmetrically disposed between said second and third housings, said first, second and third housings having first, second and third elongated rectangular faces, respectively, each of said first, second and third faces having first and second elongated edges, the first edge of said first rectangular face being disposed adjacent to the first edge of said second rectangular face and the second edge of said first rectangular face being disposed adjacent to the first edge of said third rectangular face, said second and third rectangular faces making equal angles ϕ with said first rectangular face, wherein $90° \leqq \phi \leqq 177°$,

first, second and third rows of apertures in said first, second and third housings, respectively, said apertures forming first, second and third linear arrays of apertures in said first, second and third faces, respectively, said first array of orifices being centrally disposed lengthwise along said first face, and said second and third arrays of orifices being disposed along said second and third faces, respectively, said first array being equally spaced from said second and third arrays,

means within said first housing defining a first manifold for receiving a supply of combustible gas, said first manifold communicating with said first row of apertures and supplying the same with said combustible gas, whereby a first plurality of streams of combustible gas issue from said first row of apertures,

means within said second and third housings defining second and third manifolds, respectively, for receiving a supply of said metal halide vapor, said second and third manifolds communicating with said second and third rows of aper-

tures, respectively, and supplying the same with said vapor, whereby second and third pluralities of streams of said vapor issue from said second and third rows of apertures, respectively, said second and third pluralities of streams intersecting said plurality of streams of combustible gas, and

means for supporting said first, second and third housings.

4,203,554

VALVE-NEEDLE MOUNTING FOR DYESTUFF APPLICATOR

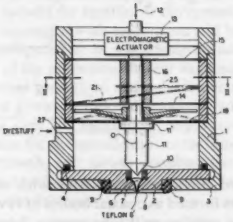
Peter Zimmer; Hans Kudlich, both of Kufstein; Karl Schweitzer, Oberlangkampfen, and Walter Mayr, Wiesing, all of Austria, assignors to Maschinenfabrik Peter Zimmer Aktiengesellschaft, Kufstein, Austria

Filed Mar. 17, 1978, Ser. No. 887,833

Claims priority, application Austria, Mar. 24, 1977, 2078/77

Int. Cl.[2] B05B *1/08*; B05C *5/00*; F16K *31/02*

U.S. Cl. 239—585 **8 Claims**



1. In a dyestuff applicator comprising a nozzle for spraying dyestuff onto a substrate to be patterned, the improvement wherein said nozzle comprises:

a housing forming a dyestuff chamber with an end wall provided with a discharge orifice centered on an axis;

a valve needle in said housing having a tip receivable in said orifice;

actuating means operatively coupled with said valve needle for selectively blocking and unblocking said orifice by displacing said valve needle along said axis; and

mounting means for movably supporting said valve needle on a generally cylindrical part of said housing centered on said axis, said mounting means including at least one membrane of resilient foil material comprising an outer ring centered on said axis and a tongue integral with said outer ring projecting radially inwardly from a sector thereof toward a diametrically opposite sector, said tongue being split into two slender branches which diverge at an acute angle and are interconnected near said opposite sector by an integral web with a re-entrant strip extending radially in a generally triangular gap between said branches and terminating in an inner ring centered on said axis, said valve needle being engaged by said inner ring.

4,203,555

ROTARY FOODSTUFF MILL AND MILLING PROCESS

Thomas D. Dickson, Jr., 1099 Del Cambre, San Jose, Calif. 95129

Continuation-in-part of Ser. No. 905,841, May 15, 1978, abandoned. This application Apr. 10, 1979, Ser. No. 28,666

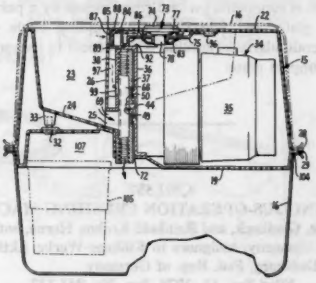
Int. Cl.[2] B02C *7/09*

U.S. Cl. 241—15 **18 Claims**

1. A process for milling a particulate material comprising:

(a) positioning a first wheel having concentric rows of circumferentially spaced, tapered plane-sided blades extending from one of its faces in spaced axial alignment with a second wheel having concentric rows of circumferentially spaced tapered plane-sided blades extending from one of its faces such that the rows of blades on the first and second wheels are interposed between each other, with the circumferential spacing between blades in the radially innermost row of the interposed rows being at least equal to the maximum nominal particle size of the material to be milled and the circumferential spacing between blades in the radially outermost row of the interposed rows being less than the circumferential spacing between blades in said radially innermost row and being at least equal to the desired maximum nominal particle size of the milled material;

(b) feeding the material into the axial space between the first and second wheels radially inward of said innermost row;



(c) rotating at least the wheel on which the innermost row is located at a speed sufficient to cause the material:

(i) to move through the spaces in the innermost row,

(ii) to be sheared between the blades of the innermost row and the row next adjacent the innermost row, and

(iii) to pass successively outwardly through the spaced between the blades of the interposed rows and be successively comminuted to a smaller particle size as it passes through each row without significant recirculation inwardly; and

(d) collecting the material once it has passed completely through the interposed rows.

4,203,556

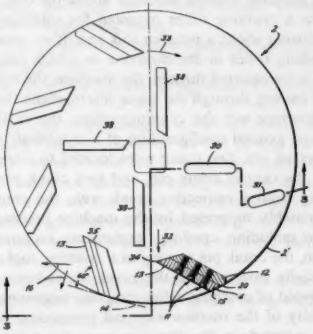
GRINDING DEVICE

William J. Krysiak, Wilmington, and Richard L. Moyer, Newark, both of Del., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Nov. 6, 1978, Ser. No. 958,223

Int. Cl.[2] B02C *18/18*

U.S. Cl. 241—86.1 **18 Claims**



1. A grinding device comprising:

rotor means rotatable about a rotor axis,

grinding blade means mounted on said rotor means for rotation in a given direction,

shear plate means arranged tangentially with respect to said rotor means, said shear plate means having perforations for shear-cutting material in cooperation with said grinding blade means, and

means for axially feeding material to be ground to said rotor means,

wherein each of said grinding blade means has an inner edge and an outer edge, the inner edge of each blade means being tilted forward of the outer edge thereof in the direction of blade rotation, wherein each of said grinding blade means is supported on said rotor means by a parallel support plate, and wherein each grinding blade means is perpendicularly adjustable with respect to its corresponding support plate.

4,203,557

CONTINUOUS-OPERATION CRUSHING MACHINE

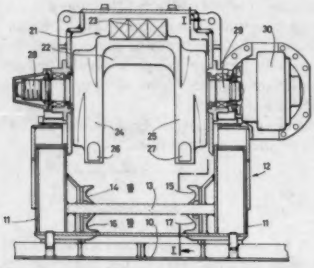
Karl Bähre, Gladbeck, and Reinhold Krohm, Herne, both of Fed. Rep. of Germany, assignors to Klökner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,137

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741127

Int. Cl.² B02C *13/09*

U.S. Cl. 241—186 R **6 Claims**



1. A crushing machine, particularly for the crushing of pieces of coal which may contain pieces of rock, the machine comprising, in combination, a conveyor guide structure for guiding transported material to be crushed through the machine; a machine housing mounted above the conveyor guide structure; a crushing roller mounted for rotation in the machine housing about a rotation axis and drive means rotating the crushing roller in the direction in which material to be crushed is transported through the machine, the material to be crushed passing through the space intermediate the conveyor guide structure and the crushing roller, the crushing roller having the general configuration of a crankshaft including a central crank pin, two crank webs located to respective axial sides of the central crank pin, and two crank journals each extending from a respective crank web, the crank journals being rotatably supported by the machine housing, and furthermore including crushing implements supported on the crank pin, the crank pin serving as a crushing tool carrier, the space axially intermediate the crank webs being an empty space devoid of crushing roller structure beginning at least in the vicinity of the rotation axis and proceeding all the way radially outwards in the direction away from the crank pin, whereby the empty space permits the passage through the machine housing of large pieces or amounts of coal.

4,203,558

CEREAL MILL

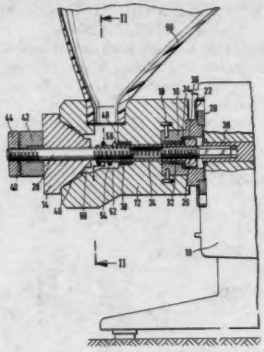
Johann G. Schnitzer, Feldbergstr. 26, 7742 St. Georgen, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,713

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716253

Int. Cl.² B02C *7/18*

U.S. Cl. 241—247 **13 Claims**



1. An improved cereal mill apparatus with stationary and rotating millstones formed as coaxial bodies of revolution, with a driveshaft of the rotating millstone passing through a central orifice within the stationary millstone, the rotating millstone being mounted on said driveshaft for rotational entrainment, and with a supply funnel in communication with a milling gap defined between said stationary and rotating millstones, wherein:

said stationary millstone serves as an external housing and a support for the cereal mill apparatus;

said driveshaft is rotatably mounted in bearing means affixed within said stationary millstone; and

said supply funnel is socketed in an upper surface of said stationary millstone and communicates with said milling gap through a supply channel radially piercing said stationary millstone.

4,203,559

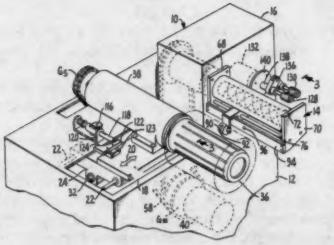
PRECISION WINDER FOR THE DRAWING AND PACKAGING OF SYNTHETIC FIBERS

Charles H. Coggin, Jr., Upland, and Tatsuo R. Sakakura, Gardena, both of Calif., assignors to Nitto Boseki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 810,430, Jun. 27, 1977, abandoned. This application Feb. 23, 1978, Ser. No. 880,634

Int. Cl.² B65H *54/08, 59/38*

U.S. Cl. 242—18 G **3 Claims**



1. A winder for directly drawing glass fiber from an orifice

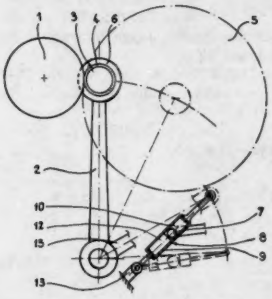
plate to form a precision wound package, said winder comprising: a traverse mounted in a fixed position, said traverse having a guide disposed for back and forth movement thereacross in a generally rectilinear path; a spindle disposed in parallel relationship to the rectilinear path of the guide; means mounting the spindle for rectilinear movement toward and away from the traverse while maintaining the relative parallel relationship of the spindle with the rectilinear path of the guide, a sensor to sense the distance between the traverse and the peripheral surface of a package of windings on the spindle; motion imparting means coupled to the spindle to move the spindle away from the traverse, said motion imparting means being operatively associated with the sensor to maintain a substantially constant distance between the traverse and the peripheral surface of windings on the spindle; a D.C. motor coupled in driving engagement with the spindle; a D.C. speed control electrically coupled to the D.C. motor to selectively vary the speed of the motor; a linear response speed command potentiometer, wherein the resistance change for each equal increment of potentiometer adjustment is the same, electrically coupled to the D.C. speed control; a cam carried by the means mounting the spindle for rectilinear movement, said cam being disposed for movement with said means and having an operating surface configured so as to provide an unequal increment of movement of the potentiometer for each equal increment of package diameter growth to maintain drawing speed constant as the package grows; a follower engaged with the operating surface of the cam for movement responsive thereto as the mounting means for the spindle moves rectilinearly in response to package growth; and means coupling the follower to the potentiometer to adjust the potentiometer in response to the movement of the follower.

4,203,560

PROCESS AND DEVICE FOR THE WINDING-UP OF TEXTILE YARN

Bernard Isoard, Ecully, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Jan. 18, 1977, Ser. No. 760,451
Claims priority, application France, Jan. 20, 1976, 76 01767
Int. Cl.[2] B65H *59/38*
U.S. Cl. 242—45 **6 Claims**



1. A winding machine for winding-up textile yarn in a take-up package comprising:

at least one yarn support mounted on a bobbin carrier;

a pilot roller continuously peripherally driving the take-up package until the package reaches a final size;

a gas turbine for axially driving the yarn support;

through means for supplying gas to the turbine through a straight-through valve which is equipped with a gas progressive restricting device which slectively restricts gas flow through the valve; and

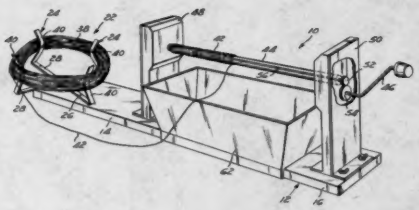
means for controlling the restricting device in accordance with the increase in size of the take-up package to progressively reduce gas flow through the valve to zero as the size of the take-up package increases, said means for controlling reducing the gas flow through the valve to zero when the size of the take-up package reaches a predetermined size which is less than the final size of the take-up package, whereby the axial drive provided to the yarn support by the gas turbine is progressively reduced to zero as the size of the take-up package approaches the predetermined size.

4,203,561

YARN CUTTER

William G. Stillings, 1006 Keats Dr., Vallejo, Calif. 94590

Filed Jul. 31, 1978, Ser. No. 929,107
Int. Cl.[2] B65H *54/02, 54/56*
U.S. Cl. 242—47 **1 Claim**



1. An apparatus for cutting a plurality identical in length pieces of yarn comprising:

a base formed of two separate base portions;

a yarn holder mounted on one said base portion, said yarn holder being adapted to support a loosely coiled quantity of yarn, said yarn holder comprising a plurality of upstanding arms, each of said arms being angularly spaced apart, said arms being connected together upon a pivot shaft, said pivot shaft being rotatable with respect to said base, each said arm including an elongated slot, said pivot shaft extending through each said slot of each said arm, lineal movement of each said arm relative to said pivot shaft varies the location of each said arm in respect to said pivot shaft, means to fixedly secure the established position of said arms relative to said pivot shaft, each of said arms including an upstanding arm concavely shaped so that the inner surface of each of said upstanding arms forms a convex surface in respect to said pivot shaft, each of said upstanding arms being formed of a material so as to be inherently flexible in a direction towards said pivot shaft, whereby the loosely coiled quantity of yarn is adapted to be placed within the concave area of each of said upstanding arms and the locating and maintaining of such being facilitated by inherent inward flexibility of each of said upstanding arms;

a pair of spaced apart stanchions mounted on the other of said base portions;

means for detachably interlocking said base portions together;

an elongated rod terminating in a pair of ends, one of said ends being rotatably mounted on one of said stanchions, the other of said ends being rotatably mounted on the other of said stanchions, said elongated rod being spaced from said base, the exterior surface of said rod including a longitudinal groove, said longitudinal groove to facilitate cooperation with a cutting instrument to cut yarn wound about said rod;

crank means for rotating said rod to wind an even layer of yarn upon said rod, said crank means being mounted on one of said stanchions; and

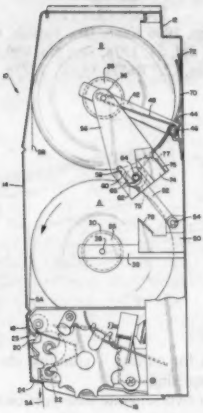
a collecting container mounted on said base between said pair of stanchions, whereby said collecting container is to collect said produced pieces of yarn.

4,203,562

FLEXIBLE SHEET MATERIAL DISPENSING OF ROLLS IN SUCCESSION

Raymond F. DeLuca, Stamford, Conn., and Gene Schwemm, East Dundee, Ill., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Sep. 8, 1977, Ser. No. 831,417
Int. Cl.[2] A47K *10/38*
U.S. Cl. 242—55.3 17 Claims



1. A dispenser for flexible sheet material comprising:

a chassis adapted to be attached to a wall at a location for flexible sheet material use,

means secured to said chassis for rotatably supporting an initial roll of flexible sheet material in a dispensing position to supply a web of said material from said initial roll,

support means for rotatably supporting a reserve roll of flexible sheet material in a reserve position spaced from the dispensing position for the initial roll, said support means being pivotally connected to said chassis to enable said support means to swing between the reserve position to a dispensing position for the reserve roll,

latch means connected to said support means having a latch condition for holding the reserve roll carried by the support means in the reserve position and an unlatch condition permitting the support means to swing about its pivotal connection to the chassis and carry the reserve roll to the dispensing position for the reserve roll, said latch means while in said latch condition being operable to gradually move the support means from an upper extermity of the reserve position to a lower extermity of the reserve position just above the dispensing position for the reserve roll, said movement being responsive to gradual depletion of the flexible sheet material of the initial roll so that when the latch means disengages from the latch condition to the unlatch condition, the support means swings only a relatively short distance to move the reserve roll from the reserve position to the dispensing position for the reserve roll,

cam means carried by said chassis engageable with said latch means to disengage the latch means from said latch condition to said unlatch condition when the flexible sheet material of the initial roll is substantially depleted, and

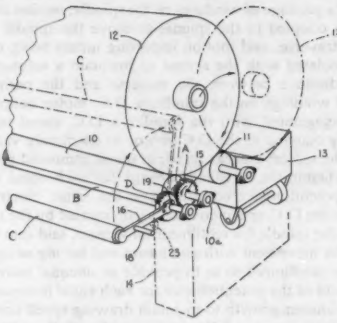
means operatively connected to said chassis for guiding a web of flexible sheet material successively from each of said rolls out of the dispenser to be accessible to a user.

4,203,563

LOOM TAKE-UP CLOTH ROLL DOFFER

William J. Alexander, III, Mauldin; John S. Cooper, Fountain Inn, and Charles E. Moore, Mauldin, all of S.C., assignors to Alexander-Cooper, Inc., Mauldin, S.C.

Filed Oct. 2, 1978, Ser. No. 947,412
Int. Cl.[2] B65H *17/12*
U.S. Cl. 242—66 3 Claims



3. A doffing apparatus for removing a full cloth roll from spaced aligned take-up rolls having a motor driving means for driving the take-up rolls for building the cloth roll comprising:

cloth roll engagable means carried in laterally spaced alignment with said take-up rolls;

means mounting said cloth roll engagable means for movement out of said laterally spaced alignment into engagement with said cloth roll removing said cloth roll from said take-up rolls; and

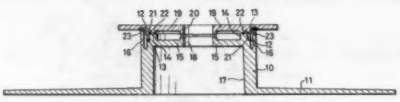
manually engagable drive means carried by said means mounting said cloth roll engagable means and being movable into driving relation with said take-up rolls for so moving said cloth roll engagable means.

4,203,564

TAPE REEL

Tsuneo Nemoto, Sendai, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1978, Ser. No. 964,718
Claims priority, application Japan, Dec. 16, 1977, 52/168354[U]
Int. Cl.[2] B65H *75/12, 75/18*
U.S. Cl. 242—71.8 11 Claims



1. A reel formed of molded synthetic resin on which a web is to be wound, said reel comprising a generally cylindrical wall defining a hollow reel hub having an inner surface and a cylindrical outer surface and first and second ends, a generally circular flange integrally connected with, and extending radially outward from said hub at the first end thereof, rib means formed within said hub substantially closing said second end of said hub, a generally circular sub-flange located at said second end of said hub and thermally welded to said rib means wherein dimensional changes of the synthetic resin of said hub flange and said rib means occur after welding of said sub-flange to said rib means, and means for isolating said cylindrical outer surface of said reel hub from deformation due to dimensional

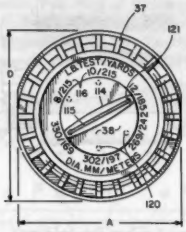
changes in said sub-flange and said rib means to prevent said reel hub from causing deformation of a web wound thereon.

4,203,565

FISHING REEL SPOOL LOCKING KNOB

John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 11, 1978, Ser. No. 932,792
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.1 R **7 Claims**



7. In a fishing reel used for storing a fishing line before casting and for storing the fishing line after casting, the reel having a housing, a center shaft mounted in the housing, a spool mounted on the shaft for holding the fishing line, means mounted on the reel for winding the fishing line on the spool, the improvement comprising:

(a) the spool having a circular front flange having an inwardly directed radial edge, the edge projecting towards the center shaft, the diameter of the edge being "B" with the diameter of the spool underneath the edge being a diameter greater than "B"; and,

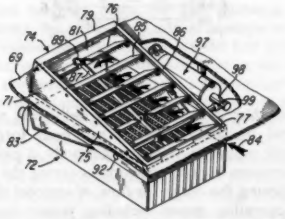
(b) a substantially circular retainer knob having an overall diameter "D" which is greater than "B" and having two flat portions spaced apart a distance "A" which is smaller than "B", the knob being retained by the spool by pushing the knob underneath the edge in a direction parallel to the flat portions whereby the edge with its diameter "B" retains the knob with its diameter "D" in the spool.

4,203,566

AIR INLET CONTROL FOR AIRCRAFT OR THE LIKE

Thomas J. Lord, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Aug. 21, 1978, Ser. No. 935,557
Int. Cl.[2] B64C *1/14*
U.S. Cl. 244—57 **9 Claims**



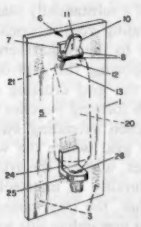
1. An air inlet control in an outer wall surface over which an air stream flows adapted to be raised above said surface to capture and redirect a portion of the flowing air stream, said control including series arranged shutter blades and said control being oriented so that said blades are successively encountered by said flowing air stream, means mounting said blades for rocking motion from a closed position in which said blades are substantially nested in said surface to an open position in the course of which said blades assume tilted positions relative to said surface exposing undersides thereof as deflecting surfaces to said encountered air stream, means achieving automatically in response to opening of said shutter blades a progressively higher elevation of at least portions of said successive shutter blades whereby said successive blades capture and redirect different laminar air layers outwardly of said surface wherein said progressively higher elevation being achieved by tilting a frame of which said shutter blades are a part, said frame and shutter blades being interconnected by linkage means which form part of said mounting means so that a tilting movement of said frame causes by a tilting motion of said shutter blades relative to said frame, said shutter blades in said open position defining a relatively large open area through which air may be inducted in the absence of said air stream, and an actuating mechanism for effecting and controlling rocking movements of said shutter blades from said closed to said open position and back to said closed position.

4,203,567

COLLAPSIBLE TUBE HOLDING BRACKET

Ivy Featherstone, 3024 Hudson St., Columbus, Ohio 43219

Filed Sep. 14, 1978, Ser. No. 942,384
Int. Cl.[2] B65D *35/56*
U.S. Cl. 248—108 **2 Claims**



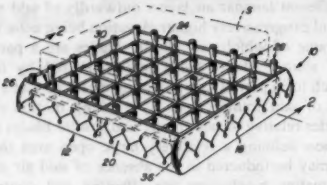
1. A tube holding bracket for supporting a collapsible paste tube having one end sealed and a capped outlet discharge end on a walled surface comprising a flat supporting plate, spaced adhesive areas on a rear surface of said plate for adjustably and removably adhering said plate to said walled surface, spring pressed clip means on a front surface of said plate for clamping said sealed end uppermost thereon and suspending said tube thereon, said clip means including flat base means formed with forwardly extending spaced apertured ears, an upstanding and angularly extending flat tongue on said clip means insertable between said ears and having a transverse bore therethrough alignable with said apertured ears for pivoting said tongue on said base means, said tongue having a lowermost clamping edge thereon, spring means on said pin means and engageable with said tongue for holding said clamping edge in clamping engagement with the sealed end of said tube, and generally L-shaped bracket means on said supporting plate spaced below said clip means and having an aperture therein for receiving and supporting said outlet discharge end therein, said bracket having a flat vertical portion and a flat horizontal portion with said aperture being formed in said horizontal portion, the rear face of said flat vertical portion being adhesively coated for removably and adjustably supporting said bracket on said plate relative to said clip means as hand pressure is applied against said clamped tube to discharge paste therefrom.

4,203,568

RACK FOR HOLDING SOAP BARS

Yvonne B. Daugherty, 1000 Cortez, Coral Gables, Fla. 33134

Filed Jun. 14, 1978, Ser. No. 915,357
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—309 R **1 Claim**



1. A rack assembly for holding soap bars, and the like, comprising, in combination:

(a) tray means forming a liquid retaining receptacle; and

(b) article support means disposed in the tray means for supporting at spaced points an article to be drained, wherein the article support means includes a framework and a plurality of flexible elements mounted on the framework in upstanding orientation for supporting the article being retained, the tray means including a tray having a substantially planar bottom wall and having extending co-directionally therefrom four upstanding side walls, said framework being removably disposed within said tray, at least about one-quarter inch of space being provided between the framework and upstanding walls, whereby the tray is brushable by the flexible elements of the framework and the soap bar is allowed to dry, wherein the framework is in the form of a substantially planar wire grid provided with legs extending co-directionally from the grid and perpendicularly to the plane thereof, the legs being arranged for supporting the grid on the tray means, the wires forming the grid crossing one another with the flexible elements forming bunches or bundles in the form of bristles disposed extending away from the legs and attached to the grid where the wires forming the grid cross one another, wherein the grid is rectangular in plan and forms a plurality of intersections where the wires cross one another, the tray means being rectangular in plan and the four upstanding side walls being connected to adjacent ones of each other, the legs of the framework being disposed removably abutting the bottom wall for being supported by the bottom wall.

4,203,569

FIN AND NOZZLE UNIT FOR A FREE-FLIGHT ROCKET

William S. Marks, Little Rock, Ark., assignor to BEI Electronics, Inc., Little Rock, Ark.

Filed Oct. 17, 1977, Ser. No. 842,381
Int. Cl.[2] F42B *13/32*
U.S. Cl. 244—3.23 **14 Claims**

2. A fin and nozzle unit for a rocket, comprising

a generally cylindrical nozzle body having rearwardly directed nozzle means thereon for discharging propulsion gases,

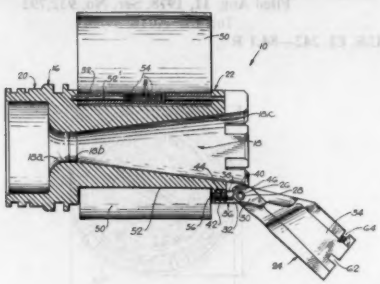
said nozzle body having a rear end portion,

a plurality of fins, and

pivot means swingably mounting said fins on said rear end portion of said body for swinging movement between retracted launch positions and extended flight positions in which said fins are swung outwardly from said launch positions through a predetermined angle,

said fins having skewed portions which are positioned opposite said nozzle means and in paths traversed by said propulsion gases when said fins are in said retracted launch positions for causing said propulsion gases to act upon said skewed portions to produce spinning movement of the rocket,

said skewed portions being carried outwardly out of said propulsion gases when said fins are swung outwardly into said extended flight positions to avoid imparting further spin to the rocket when said fins are in said extended flight positions,



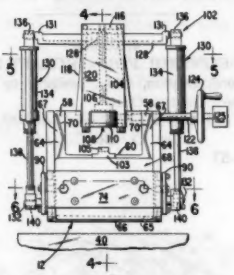
said skewed portions being bent about bend lines which are substantially parallel with the longitudinal axis of said nozzle body when said fins are in their extended flight positions whereby said fins are aerodynamically neutral when in said extended flight positions to avoid imparting further spin to the rocket.

4,203,570

POWER-OPERATED LOADING GATE FOR CENTRIFUGAL MACHINES INCORPORATING AN AUXILIARY DRIVE DEVICE

Donald L. Hurley, Hamilton; Francis H. Wessel, North Bend, and Joseph B. Bange, Hamilton, all of Ohio, assignors to The Western States Machine Company, Hamilton, Ohio

Filed Aug. 23, 1978, Ser. No. 936,117
Int. Cl.[2] F16K *31/163*
U.S. Cl. 251—14 **12 Claims**



1. In a loading gate assembly for delivering massecuite or like material, including a hollow gate body forming a spout outlet, a gate supporting face on said body, a gate slidable on said face between a closed position covering the outlet and a position opening the outlet for flow of material therethrough, and gate operating means including power operated drive means secured to a relatively fixed support and means drivable by said drive means and connected with said gate for moving the gate between closed and open positions,

the improvement which comprises means normally positioning said support in a fixed location relative to said outlet yet being operable to displace said support in the direction of closing movement of said gate, and secondary drive means connected with and for operating said positioning

means to move said gate to closed position by displacement of said support in the even of failure of the power supply to said power operated drive means while the gate is open, said secondary drive means including both a power operable motor and a hand operable means connected with and for operating said positioning means so that the gate is movable to closed position by manual operation in the absence of power supply to said motor.

4,203,571

MULTIWAY SWITCHING VALVE

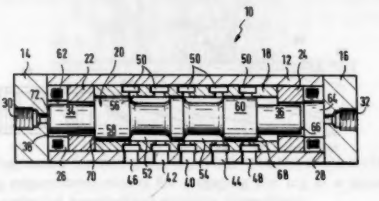
Erich Ruchser, Stetten, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Jun. 20, 1978, Ser. No. 917,395

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729482

Int. Cl.[2] F16K *11/07, 31/122;* F15B *13/042*

U.S. Cl. 251—31 **2 Claims**



1. A valve for use in directing the flow of at least one controlled fluid in response to the flow of a controlling fluid, comprising a magnetically responsive elongated valve body having a first end, a second end, a center intermediate the ends, a central beam elongated along a working axis and extending between the ends, and a plurality of partitions which plurality includes a first partition and a second partition, the partitions extending radially outwardly from the beam perpendicular to the working axis, with the first partition being located near the first end and being spaced therefrom towards the center and the second partition being located near the second end and being spaced therefrom towards the center with the spacings being of equal length and any other partitions in the plurality being located intermediate the first and second partitions; first and second like annular abutment rings, the first abutment ring encircling the beam adjacent the first end of the valve body and the second abutment ring encircling the beam adjacent the second end of the valve body in a manner that the partitions are located intermediate the abutment rings and the valve body is movable back and forth along its working axis until one of the first and second partitions abuts its corresponding abutment ring; first and second like, annular permanent magnets, the first magnet adapted for receiving the first end of the beam when the first partition abuts the first abutment ring and thereby retaining the valve body in that position by magnetic attraction between the first magnet and the first partition and the second magnet adapted for receiving the second end of the beam when the second partition abuts the second abutment ring and thereby retaining the valve body in that position by magnetic attraction between the second magnet and the second partition; and a housing completely surrounding a working cavity in which the entire valve body, the abutment rings and the magnets are all located, the rings and the magnets being secured to the housing and the valve body being movable therein along its working axis in the above-described manner, the housing having a first controlling port adjacent the first end of the valve body to allow a controlling fluid to be introduced into the housing and to press against the first end to thereby urge the valve body away from the first magnet, the housing further having a second controlling port adjacent the second end of the valve body to allow a controlling fluid to be introduced into the housing and to press against the second end to thereby urge the valve body away from the second magnet, and the housing still further having a plurality of controlled ports spaced from each other and communicating with the working cavity and being connectable to and separate from each other via the cavity as a function of the position of the partitions on the valve body with respect to the locations of the controlled ports, whereby the flow of a controlled fluid entering the housing through at least one of the controlled ports may be directed into and blocked off from at least one other one of the controlled ports.

4,203,572

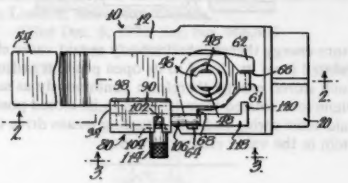
LOCKING BALL VALVE

Ronald D. Coffman, McHenry, Ill., assignor to Coffman Manufacturing Corp., Cary, Ill.

Filed Oct. 12, 1978, Ser. No. 950,588

Int. Cl.[2] F16K *35/00*

U.S. Cl. 251—95 **9 Claims**



1. In a valve including a housing having a fluid flow passage therethrough, a closure member in said passage movable through a right angle to open or close said passage, a handle connected to move said closure member, stops on said housing situated about 90° apart with respect to the center of rotation of said stops and thereby limit the movement of said handle between said open and closed positions of said closure member; a valve lock comprising a shaft rotatably mounted to said handle for movement about said shaft's axis independent of said handle movement, said shaft having a plate rigidly attached thereto extending to one side of the axis thereof, said shaft being rotatable relative to said handle to a first position where said plate confronts closely a surface of one of said stops when said valve is in either the full open or the closed position wherein the tongue of the handle encounters the stop, at that position, to thereby prevent the displacement of said handle from said open or closed position, and to another position wherein said plate is removed from confrontation with said stop surfaces.

4,203,573

REVERSIBLE MOTOR OPERATED VALVE WITH SPRING ASSIST

Gary R. Boss, New Berlin, Wis., assignor to Erie Manufacturing Company, Milwaukee, Wis.

Filed Oct. 26, 1976, Ser. No. 735,794

Int. Cl.[2] F16K *31/02;* F03G *1/06*

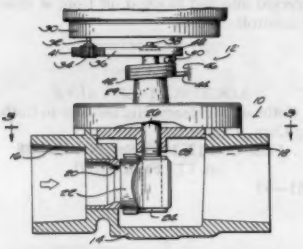
U.S. Cl. 251—133 **3 Claims**

1. A motor operated valve comprising:

a valve means including a casing having an inlet, an outlet and a valve seat therein, said valve means further including a valve element movably mounted in said casing to control flow therethrough, said valve member mounted for pivotal movement into and out of sealing engagement with said valve seat by means of a valve stem rotatably mounted in said valve casing and extending through said casing to the exterior thereof; and

a reversible motor driven actuating means for said valve means, said actuating means including a reversible motor drive unit having an output drive shaft which can be driven in both a clockwise and a counterclockwise direction, said actuating means further including a gear means to operatively connect said motor drive shaft to said valve

stem of said valve means so that when said drive shaft of said motor unit is driven in one direction or the other, said valve stem will be rotated to cause said valve element to move between its closed and open position, said actuating means further including a torsion assist spring mounted on the axis of said valve stem, said assist spring adapted to



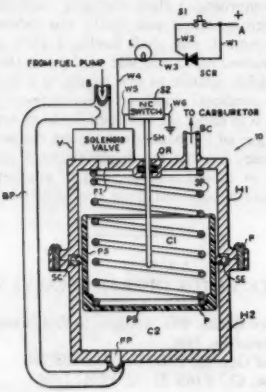
store energy therein continuously as said valve element is rotated from its closed to its open position and to release such stored energy therefrom continuously as said valve element is rotated from its open to its closed position and said assist spring and said actuating means drive the valve stem in the valve closing direction.

4,203,574

FLUID FLOW MEASUREMENT APPARATUS

Floyd M. Minks, 2700 Partin Settlement Rd., Kissimmee, Fla. 32741

Continuation-in-part of Ser. No. 635,221, Nov. 25, 1975, Pat. No. 4,054,054. This application Sep. 19, 1977, Ser. No. 834,716
Int. Cl.[2] F16K *31/06*
U.S. Cl. 251—139 **4 Claims**



1. An electrical solenoid actuated fluid valve comprising in combination:

a center tube;

electrically actuated coil means surrounding said center tube;

a slidable piston slidably mounted in said center tube and having a passageway therethrough and a valve element mounted thereon, said piston having first and second positions in said center tube;

a valve seat mounted in said center tube and having an opening therethrough;

seal means attached to said valve seat surrounding the opening therein to seal said valve element against said valve seat when said slidable piston is in said first position upon actuation of said electrically actuated coil and to open a passageway through said valve seat and through said slidable piston when said slidable piston is in said second position, whereby the valve can be opened and closed responsive to the actuation of said coil; and

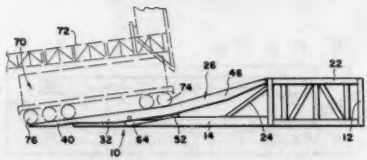
said valve seat having a seating portion and an annular flange protruding therefrom and having an O-ring attached adjacent to said flange onto said valve seat whereby said O-ring is compressed when said valve element is closed against said valve seat.

4,203,575

HYDRAULIC ELEVATING RAMP

Earl R. Johnson, Tulsa, Okla., assignor to Loffland Brothers Company, Tulsa, Okla.

Filed Mar. 15, 1979, Ser. No. 20,917
Int. Cl.[2] E02C *3/00*
U.S. Cl. 254—88 **5 Claims**



1. An elevating ramp for wheeled vehicles and comprising a support base structure having an elevated support element, a ramp assembly extending outwardly from said support base structure and pivotally connected therewith for alternate lowered and raised positions with respect to the surface of the ground, said ramp assembly comprising at least two successive end to end separate sections disposed at planar angles with respect to each other, the angular difference between the two sections being approximately 7° , a first of said sections being of a length at least as great as the wheel base of the vehicle and being disposed adjacent the surface of the ground in the lowered position of the ramp assembly for initially receiving the vehicle thereon and extending at an upward angle of approximately 7° between the surface of the ground and the beginning of the succeeding section, said succeeding section extending upwardly from the first section whereby the vehicle may be driven along the entire length of the ramp apparatus through a total angular elevation of 14° with respect to the surface of the ground while maintaining no driving angle for the vehicle in excess of approximately 7°.

4,203,576

ELEVATING ASSEMBLY FOR AN OFFSHORE PLATFORM

John R. Sutton, P.O. Box 32, Beaumont, Tex. 77704

Filed Jul. 11, 1978, Ser. No. 923,583
Int. Cl.[2] B66F *7/12*
U.S. Cl. 254—89 R **22 Claims**

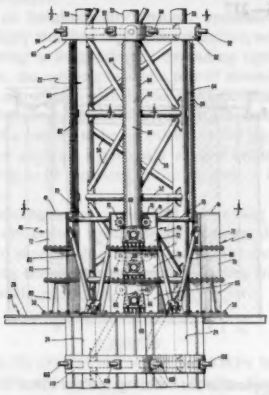
1. In an offshore platform of the type having a deck and a plurality of ground engaging legs slidably extending through the deck, an improved jacking means for causing relative movement between the deck and the legs comprising:

lifting means including drive means for causing movement between the deck and a leg, releasably connected to the deck, operable in one direction at a first speed, operable in a second direction at a second speed greater than the first speed, including a pair of counterrotating pinions each having an axis, the axes being spaced from one another in a generally horizontal plane;

rack means for engagement with the pair of pinions having a pair of linear tooth profiles received between the pair of pinions and engaged therewith, extending generally parallel to the leg with a length exceeding the sum of platform

draft and maximum wave height, and movable relative to the deck by operation of the drive means;

yoke means for selectively engaging the leg at preselected longitudinal positions therealong, pivotally connected to the rack means and movable therewith; and



locking means for fixing the leg relative to the deck, including engagement means for engaging the leg at a second preselected longitudinal position therealong.

4,203,577

CAR JACKS

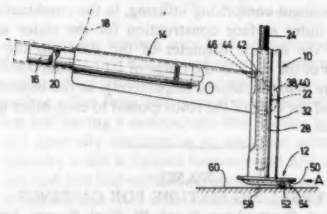
Franz X. Hafner, Wurmlingen, Fed. Rep. of Germany, assignor to E. A. Storz GmbH & Co. KG, Tuttlingen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,837

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751202

Int. Cl.[2] B66F *3/36*

U.S. Cl. 254—100 **18 Claims**



1. In a car jack apparatus for elevating a vehicle body relative to a supporting surface, including a base member; a generally vertical hollow stand member connected at its lower end with said base member, said stand member containing a vertical slot affording access to the interior of the stand member; a nut member guided for vertical displacement within said stand member; a carrier arm connected at one end with said nut member for pivotal movement about a horizontal pivot axis between generally horizontal operable and generally vertical downwardly extending collapsed positions, respectively, said nut member and said carrier arm one end having cooperating abutting surfaces for preventing pivotal movement of said carrier arm beyond said generally horizontal operable position, said carrier arm extending horizontally through said slot for insertion at its other end within an opening contained within said vehicle body; and means including a spindle member arranged for rotation longitudinally within said stand member and threadably connected with said nut member for vertically displacing said nut member relative to said stand member;

the improvement wherein

said base member (**12**) includes on its lower surface at least one downwardly depending projection (**52, 54, 56, 58, 68, 74, 84, 86, 94**) contained in a plane which contains the axes of both said carrier arm and said stand member, each said projection being radially spaced from the axis of said stand member on the opposite side thereof from said carrier arm, thereby to cause said stand member, when said other end of the carrier arm is inserted within the vehicle body opening and said spindle is rotated to vertically displace said nut member relative to said stand member, to be tilted about said projection toward the vehicle body to a pitched orientation relative to the supporting surface.

4,203,578

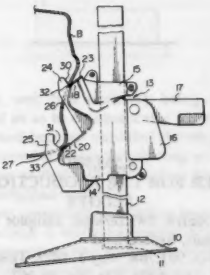
DOUBLE FINGERED BUMPER JACK BODY

Oatway Marguerattt, Orillia, Canada, assignor to Seeburn Metal Products Limited, Beaverton, Canada

Filed Dec. 5, 1978, Ser. No. 966,805

Int. Cl.[2] B66F *1/04*

U.S. Cl. 254—109 **3 Claims**



1. A bumper jack including a ratchet bar, and a load lifting housing mounted on said bar for movement therealong, said load lifting housing comprising steel side walls surrounding said ratchet bar, with said side walls at one side of said ratchet bar forming therebetween a lower bumper engageable ledge and an upper bumper engageable ledge, said ledges being formed by bending edges of said steel side walls inwardly to form a flat surface sloping downwardly away from the ratchet bar, and said housing also including at the lower edge of each ledge an upwardly projecting finger member with each finger having an upwardly and outwardly sloping upper edge portion adjacent a ledge, forming a trough between the finger and the ledge, said fingers being adapted to extend through a pair of vertically alingned slots in a bumper with the ledges engaging the outer face of the bumper.

4,203,579

INSTALLATION FOR TEMPERING LONG CYLINDRICAL PIECES IN FORM AND IN THIN LAYER

Jean L. Missioux, 55 Boulevard Gambetta, 95110 Sannois, France

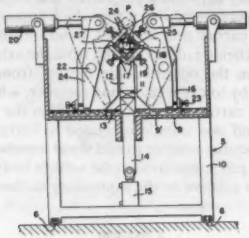
Continuation-in-part of Ser. No. 812,361, Jul. 1, 1977, abandoned. This application Jan. 9, 1979, Ser. No. 2,235

Int. Cl.[2] C21D *9/30*

U.S. Cl. 266—117 **6 Claims**

1. An installation for tempering in a thin layer shaped long cylindrical workpieces such as drive shafts and cam shafts for automobile engines including means for gripping workpieces in an austenization furnace, a center central tempering unit having a tempering tank and a transfer conveyor for the workpieces, the improvement comprising for said tempering unit a preadjusted and interchangeable support mechanism for the

workpiece in said tank, a movable gripping system for the workpiece, pivoting levers carrying said system, closing jacks actuating said levers on opposite upper sides of said tempering



tank, sealing means for limiting the thickness of the layer of tempering liquid applied to the workpiece to an appropriate value and means for feeding tempering liquid to said unit.

4,203,580

STATIC MIXER FOR THE PRODUCTION OF METAL ALLOYS

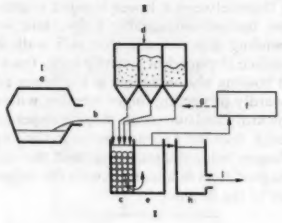
Kurt Buxmann, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 901,708, May 1, 1978. This application Mar. 14, 1979, Ser. No. 20,367

Claims priority, application Switzerland, Jun. 2, 1977, 6766/77

Int. Cl.[2] C21C *1/00*

U.S. Cl. 266—216 **11 Claims**



1. A static mixer for the production of metal alloys which comprises a through-flow container which stands under atmospheric pressure and through which molten metal is passed, and a mechanical proportioning and feed device in communication with said container for making additions of alloying material thereto for dissolving same in the melt, wherein said through-flow container contains an obstacle to the flow of molten metal in the form of an exchangeable bed of head resistant, inert granular particles, said particles filling at least a portion of said container to provide a tortuous path therethrough whereby the components to be mixed are repeatedly divided and united again by said particles as the melt flows through the bed wherein the degree of mixing can be changed by altering the size of the particles, wherein the melt leaves the container intimately mixed.

4,203,581

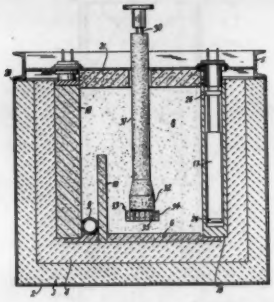
APPARATUS FOR REFINING MOLTEN ALUMINUM

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,662

Int. Cl.[2] C22B *9/00*

U.S. Cl. 266—217 **4 Claims**



1. In an apparatus for refining molten metal comprising, in combination:

(a) a vessel;

(b) inlet and outlet means for molten metal and gases; and

(c) at least one rotating gas distributing means disposed in said vessel, said gas distributing means comprising (i) a rotatable shaft coupled to drive means at its upper end and fixedly attached to a vaned circular rotor at its lower end; (ii) a hollow stationary sleeve surrounding said shaft and fixedly attached at its lower end to a hollow circular stator; (iii) an axially extending passageway for conveying and discharging gas into the clearance between the rotor and stator, said passageway being defined by the inner surface of the sleeve and stator and the outer surface of the shaft and (iv) means for providing gas to the upper end of the passageway under sufficient pressure to be injected into the vessel,

the improvement comprising utilizing, in the combination, a smooth outer surface construction for the stator and a ratio of the outside diameter of the stator to the root diameter of the rotor in the range of 1:1 to about 0.8:1, said diameters being measured respectively, at the base of the stator and the base of the rotor closest to each other in the apparatus.

4,203,582

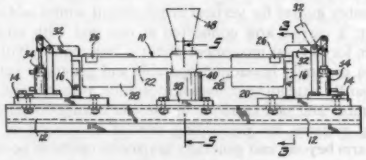
UNIVERSAL JIG FIXTURE FOR CASTINGS

Robert L. Hart, Spartanburg; Frank W. Paul, Seneca, both of S.C., and Wolfgang J. Sauer, Pittsburgh, Pa., assignors to The United States of America as represented by the Department of Commerce, Washington, D.C.

Filed Jun. 12, 1978, Ser. No. 915,068

Int. Cl.[2] B23Q *3/08*

U.S. Cl. 269—32 **5 Claims**



1. A jig for locating and supporting, in fixed relation to a base structure, a tree casting including a central, elongated

runner having longitudinally spaced support portions and a downwardly extending sprue cup between said support portions, each of said support portions having a pair of downwardly and inwardly converging planar sides, said jig comprising

(a) a base structure;

(b) a pair of longitudinally spaced, upstanding support blocks ridigly attached to the base structure, each support block having a longitudinally extending opening in its upper side, the opening having a pair of downwardly and inwardly converging planar sides corresponding in geometry to the planar sides of a respective runner support portion of a casting to be supported in the jig;

(c) means for applying a generally vertical holddown force to a casting to be mounted in the jig area of the support block; and

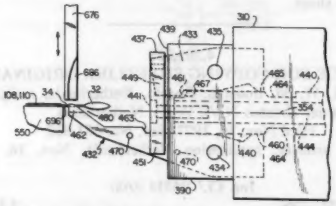
(d) an upstanding sprue cup holder comprising an annular array of upstanding spring finger elements disposed between said support blocks for engaging the sprue cup of a tree casting thereby to prevent said casting from moving longitudinally relative to said base structure.

4,203,583

RADIAL LEAD COMPONENT INSERTION MACHINE

Albert W. Zemek, Windsor; Frederick Tomko, Vestal, both of N.Y.; Crawford Matson, Wyalusing, and Burr Darrow, New Milford, both of Pa., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed May 19, 1978, Ser. No. 907,564
Int. Cl.² B25B *5/08*
U.S. Cl. 269—234 **4 Claims**



1. A gripper for holding wire leads, comprising:

a block having first and second primary surfaces with a first surface offset from said first primary surface and a second surface offset from said second primary surface;

a first leaf having a surface, said lead surface being adjacent and generally conforming to said first primary surface, whereby a slot is formed between said first offset surface and said first leaf surface, said slot dimensioned for a press fit against said wire lead when said lead is in said slot and said first leaf surface is pressed toward said first primary surface of said block;

a second leaf adjacent and generally conforming to said second primary surface whereby a second slot is formed; and

releasable means to press said first and second leaves toward said first and second primary surfaces respectively whereby a component having two leads is clasped with each lead in an individual slot.

4,203,584

METHODS AND APPARATUS FOR INTERFOLDING BUNDLES OF INTERFOLDED WEBS

Jesse B. Smaw, East Paterson, N.J., assignor to Marcal Paper Mills, Inc., Elmwood Park, N.J.

Filed Mar. 3, 1978, Ser. No. 883,299
Int. Cl.² B41L *1/30*
U.S. Cl. 270—40 **13 Claims**

1. In an apparatus for interfolding first and second endless bundles of interfolded paper webs, said apparatus being of the type comprising:

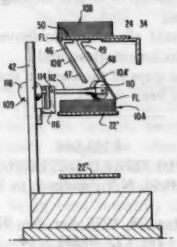
means for forming first and second bundles of interfolded webs;

means for advancing said first and second bundles in vertically spaced relation from one another and in converging directions of travel;

bundles merging means comprising:

a first fold surface for holding an uppermost web half of a bottom one of the bundles in an unfolded position as the bundles are being converged, and

a second fold surface for holding a lowermost web half of a top one of the bundles in an unfolded position as the bundles are being converged,



said uppermost web half normally being continuous and uninterrupted so as to automatically travel over said first fold surface and become unfolded thereby,

said first and second surfaces terminating prior to mergence of said bundles so that said web halves are released into a mutually interfolded condition;

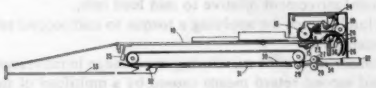
the improvement comprising unfolding means for unfolding a web half which is broken or constitutes part of a new web having no connection with a downstream upper web half, said unfolding means being disposed upstream of said first fold surface for acting upon an upper surface of a section of said uppermost web half which has no connection with a downstream web half, to unfold said uppermost web half for travel along said first fold surface.

4,203,585

DOCUMENT FEED FOR A COPIER MACHINE

Barton H. Kunz, Longmont; Myron F. Shlatz, and Jesse W. Spears, both of Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,979
Int. Cl.² B65H *3/52*
U.S. Cl. 271—4 **3 Claims**



2. In a document copier machine, an automatic document feed device comprising a tray for holding stacks of documents, wave generator document feeding means and nip rollers for receiving documents fed by said feeding means, a method for serially feeding said documents to a document glass at which said documents are held in a stationary manner during the copying operation comprising the steps of:

(1) manually loading a stack of documents onto said tray;

(2) activating said feeding means to move said documents in a shingled manner to cause the first topmost document to move up a ramp, across a restraint pad and down into the nip area of said nip rollers;

(3) halting the feeding of said topmost document when the

leading edge thereof is sensed by sensing means at a position just beyond said nip area;

(4) activating said nip rollers to move said topmost document through a guideway toward said document glass, said topmost document being pulled down onto said restraint pad so that subsequent documents, if moved, are directed into said restraint pad;

(5) positioning said document on said glass;

(6) making the requisite number of copies;

(7) during the time frame of step 6, operating said feeding means to move the second topmost document up said ramp, across said restraint pad and down into said nip area until said sensing means senses the leading edge thereof and halts the feeding operation;

(8) after the conclusion of step 6, moving the first document off of said glass;

(9) reactivating said nip rollers to move the second document to said document glass; and

(10) repeating the steps of the method until all documents in said stack have been copied.

4,203,586

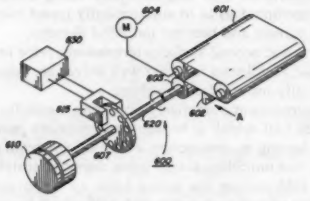
MULTIFEED DETECTOR

August Hoyer, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 28, 1978, Ser. No. 919,881

Int. Cl.[2] B65H *3/04*

U.S. Cl. 271—34 **2 Claims**



1. A sheet feeding apparatus, comprising:

(a) feed belt means for feeding sheets through a feed path;

(b) drive means for driving said feed belt;

(c) first stationary retard means located adjacent said feed belt for forming a nip for the passage of sheets therebetween;

(d) second retard means adjacent to and adapted for frictional engagement with said feed belt, said second retard means being located downstream of said nip formed between said first retard means and said feed belt and in the path of sheets fed by said feed belt means;

(e) a shaft for supporting said second retard means for rotational movement relative to said feed belt;

(f) clutch means for applying a torque to said second retard means; and

(g) sensor means for monitoring any change in movement of said second retard means caused by a multifeed of sheets decreasing the frictional engagement between said second retard means and said feed belt.

4,203,587

SHEET SORTER DEVICE

Hirotoshi Kishi, Tokyo; Hiroyuki Hattori, Inagi, and Katsuichi Shimizu, Hoya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1977, Ser. No. 815,060

Claims priority, application Japan, Jul. 27, 1976, 51-89485; Dec. 25, 1976, 51-157188; Jan. 11, 1977, 52-1701

Int. Cl.[2] B65H *39/10*

U.S. Cl. 271—293 **5 Claims**

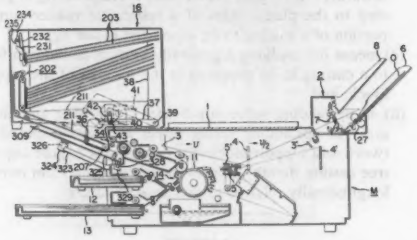
1. A sheet sorter device comprising:

sheet introducing means for introducing, at a fixed position sheets to be sorted;

a plurality of bin trays for receiving sheets from said sheet introducing means, each tray having a spacer to maintain spaces between adjacent bin trays;

bin tray holding means for holding said trays stacked in a pile, wherein the lowermost said tray is initially held above said fixed sheet introducing position;

guiding means for guiding the trays downwardly in said bin tray holding means; and



control means for controlling the lowermost tray to move along the guiding means under the force of gravity, to place the lowermost tray in a position for receiving a sheet, and for successively controlling the remaining trays to move downwardly under the force of gravity to form another pile of trays below said sheet introducing means, wherein said trays are successively positioned for receiving a sheet.

4,203,588

DEVICE FOR COPYING SHEETLIKE ORIGINALS

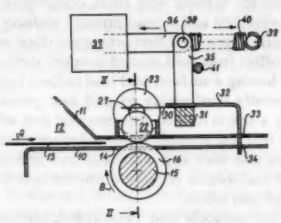
Joannes J. W. M. Joosten, Baarlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Nov. 16, 1977, Ser. No. 851,832

Claims priority, application Netherlands, Nov. 16, 1976, 7612692

Int. Cl.[2] B65H *9/06*

U.S. Cl. 271—246 **2 Claims**



1. In an apparatus for feeding sheetlike originals to be copied, including a defined path for the original having a feed section with guide elements which together form a feed slot and a continuously driven roller means for conveying an original introduced in the path, the improvement comprising an arresting element located behind the driven roller means when viewed in the direction of movement of the original and movable between two positions, namely a first position in which the arresting element blocks the path and a second position in which the arresting element lies outside of the path, a plurality of freely rotatable spherical elements with which the driven roller means cooperates in the first position such that a force exists between the driven roller means and the spherical elements which is sufficient to convey an original up to and against the arresting element, after which the driven roller

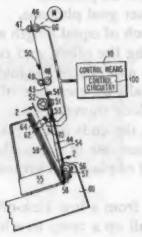
means slips relative to the original, a plurality of freely rotatable friction rolls cooperating with the driven roller means in the second position of the arresting element to convey the original further, a lever rod rotatable to at least a first and a second position, the arresting element being connected to the lever rod, the friction rolls being disposed on a flexible element connected to the lever rod, the arresting element and the friction rolls being movable in interdependent relationship to one another when the lever rod rotates, the first and second positions of rotation of the lever rod being such that rotation from one position to the other moves the friction rolls a distance which is greater than the distance which exists, in the first position of the arresting element, between the surfaces of the driven roller means and the friction rolls, thereby causing the flexible element to urge the friction rollers against the driven roller means in the second position of rotation of the lever rod.

4,203,589

JAM DETECTOR

Fred V. Arrasmith, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,918
Int. Cl.[2] B65H *43/08, 7/14*
U.S. Cl. 271—258 **12 Claims**



1. Apparatus for detecting jams in a series of documents moving along a predetermined document path comprising:

a sensing assembly for producing a first signal having a first state which detects the presence of a document at a predetermined position in said document path and having a second state which detects the absence of a document at the predetermined position in the document path;

means for producing pulses for each predetermined increment of document advance along the document path;

means for generating a jam signal;

an electric control signal generating circuit arrangement having first input terminals connected to said means for producing pulses and second input terminals connected to said sensing assembly and output terminals connected to said means for generating a jam signal; and

circuitry intermediate said input and output terminals for accumulating said signals produced by said sensing assembly;

said circuitry comprising means for sensing the signals produced by said sensing assembly in response to each pulse for a predetermined increment of document advance along the document path and means for increasing the accumulation level in response to one of said states of said signals produced by said sensing assembly and by decreasing the accumulation level in response to said other state of said signals produced by said sensing assembly;

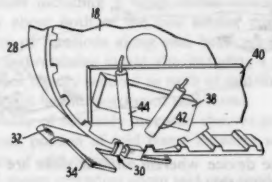
and means for producing an output signal to energize said means for generating a jam signal when said accumulation level reaches a predetermined limit.

4,203,590

GRIPPER BELT TRANSFER

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Filed Jan. 9, 1978, Ser. No. 867,811
Int. Cl.[2] B65H *7/02, 29/04*
U.S. Cl. 271—265 **7 Claims**



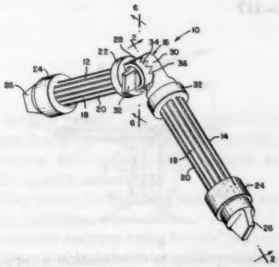
1. A fabric workpiece transport mechanism comprising a pair of spaced apart wheels, a continuous drive belt of resilient material entrained about the wheels, switch actuated motor means for intermittently driving the wheels and the belt, at least one unitary gripper finger permanently attached to the belt for clasping the edge of a fabric workpiece against the belt, the gripper finger being bent inwardly toward the belt to deform the belt from its natural configuration, and sensor switch means for detecting the presence of a fabric workpiece edge between the gripper finger and the belt and for then energizing the motor means.

4,203,591

ARM, WRIST AND SHOULDER FRICTION TYPE EXERCISING DEVICE

Stan Gibson, Richmond, Canada, assignor to Graphic Holdings, Ltd., Surrey, Canada

Filed Nov. 7, 1977, Ser. No. 849,222
Int. Cl.[2] A63B *5/00*
U.S. Cl. 272—67 **7 Claims**



1. An arm, wrist and shoulder exercising device, comprising a pair of tubular hand grips, each of said hand grips being coaxially mounted about respective, elongated spindles which are connected to each other by adjustable coupling means for selectively varying the angle between said spindles, said clutch means including the point of substantial intersection of the extension of the axes of the spindles said device further including hand grip mounting means for allowing said hand grips to rotate with respect to each other, said mounting means further including adjustable clutch means for selectively varying the force required to rotate said hand grips with respect to said hand grip mounting means.

4,203,592

HORSESHOE TYPE GAME DEVICE

Tony Quatkemeyer, 3190 Browning, Sarasota, Fla. 33577

Filed Aug. 23, 1978, Ser. No. 936,181
Int. Cl.[2] A63B *67/06*
U.S. Cl. 273—336 4 Claims

1. A game device wherein annular disks are pitched at a target area comprising:

a pair of target areas each being formed only of resilient, artificial grass-like carpet material for absorbing the shock of landing disks and providing for compact storage thereof, each of said target areas disposed in a horizontal plane;

a pair of stakes, one of said stakes extending vertically from each of said target areas providing first targets which an annular disk may be tossed toward;

a depression disposed within each of said target areas providing second targets for an annular disk to be pitched toward;

a plurality of annular disks for pitching at said target areas; and

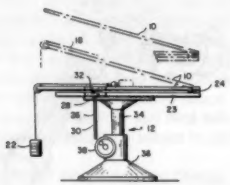
further wherein said depression is circular in shape and has a diameter which is larger than the outside diameter of said annular disk so as to enable said disk to fit wholly within said depression, and the lateral dimensions of said stake are much less than the inside diameter of said annular disk and thus enabling said annular disk to fit easily over and surround said stake.

4,203,593

WORK TABLE FOR OCCUPATIONAL THERAPY

Marcy Coppelman, 185 Evelyn Rd., Needham, Mass. 02194

Filed May 8, 1978, Ser. No. 903,490
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—117 10 Claims



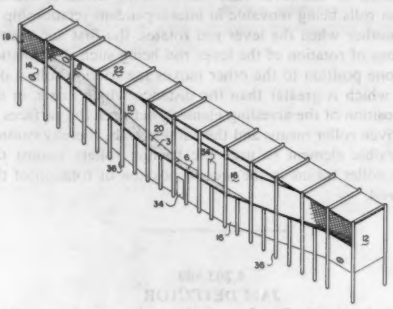
1. Apparatus comprising in combination a support, a rigid, uniformly-flat tabletop defining a working surface, hinge means pivotally connecting one edge of the table top to the support for angular adjustment of its working surface about a horizontal axis to dispose said working surface in an inclined plane, a flexible cord supported in a manner to reduce frictional drag at the distal edge of the table for movement of a portion thereof around the distal edge toward the proximal edge, means connected to one end of the cord yieldably resisting movement of the cord toward the proximal edge of the table and clamp means attached to the other end of the cord for attaching an implement thereto to prevent the latter from slipping off the working surface of the tabletop when the tabletop is situated in an inclined position.

4,203,594

SOCCER COURT

David G. Cagle, 4413 - 10th, Lubbock, Tex. 79416

Filed Jul. 10, 1978, Ser. No. 919,151
Int. Cl.[2] A63B *67/00, 69/00*
U.S. Cl. 273—411 30 Claims



1. A soccer court comprising:

a. a playing surface having

(i) a width,

(ii) a length of several times the width,

(iii) a low kick-off plateau,

(iv) two higher goal plateaus,

(v) ramps, each of equal length and of equal incline to the other, facing the other, and running between the kick-off plateau and one of the higher plateaus,

b. planar sidewalls on each side of the playing surface with at least one door therethrough,

c. goal walls at the ends of the playing suface,

d. goals in at least one of the walls at the goal plateau.

27. The method of playing a groundball game wherein each team:

a. moves a ball from a low kick-off plateau,

b. moves the ball up a ramp to a higher goal plateau, and

c. moves the ball through a goal at the goal plateau while

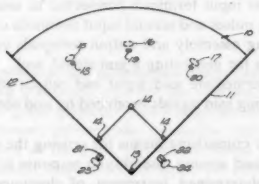
d. preventing the other team from taking the ball, at any time and at any area of play.

4,203,595

BASEBALL FIELDERS SIGNALING APPARATUS

James E. Thompson, 4201 Don Tomaso Dr., Apt. 8, Los Angeles, Calif. 90008

Filed Nov. 3, 1977, Ser. No. 848,082
Int. Cl.[2] A63B *71/00*
U.S. Cl. 273—25 13 Claims



2. Baseball fielder signaling apparatus comprising:

control means to be operated by a person positioned to view two adjacent first and second fielders in a baseball game, and including radio transmitter means operable to transmit selectively two different radio signals under the control of said person for instructing said adjacent fielders as to which should attempt to field a particular batted ball;

said control means including manually operated means actu-

able by said person between a first condition causing said transmitter means to transmit a first of said radio signals and a second condition causing said transmitter means to transmit a second of the radio signals; and

first and second fielder units constructed and adapted to be worn by said two adjacent fielders respectively during a game in a manner avoiding substantial interference with their movements in fielding a ball;

said first fielder unit being constructed to receive said first radio signal and produce in response thereto but not in response to said second signal an output which can be sensed by the first fielder and indicate to him whether he is to field the ball;

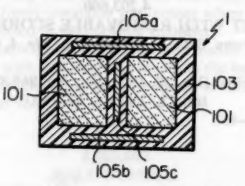
said second fielder unit being constructed to receive said second radio signal and produce in response thereto but not in response to said first radio signal an output which can be sensed by the second fielder and indicate to him whether he is to field the ball.

4,203,596

RACKET AND A METHOD FOR MANUFACTURING SAME

Itsushi Nagamoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 2, 1977, Ser. No. 847,717
Claims priority, application Japan, Nov. 4, 1976, 51-148381
Int. Cl.[2] A63B *49/04*
U.S. Cl. 273—73 J **15 Claims**



1. An improved racket comprising a racket frame including a striking section and a handle section, said handle section including an elongated envelope made of fiber reinforced plastics, at least one or more weight elements substantially fully embedded in said envelope in only the grip portion of said handle section, said weight elements being of metallic material having a specific gravity being equal to or greater than the specific gravity of iron.

14. A method for manufacturing a racket comprising preparing a frame including an elongated prepreg envelope made of numerous reinforcing fibers preimpregnated with a thermosetting resin, setting said frame in position in a mold while curing the former, concurrently attaching one or more weight elements to said frame in said mold only in a portion to be formed into the grip portion in the end product, and hardening said resin by application of heat under pressure within said mold, said weight elements being of metallic material having a specific gravity equal to or greater than the specific gravity of iron.

4,203,597

THROATLESS TENNIS RACQUET

Frederick W. Reedhead; Rowland E. Reedhead, both of Trenton, and George W. Reynolds, Tinton Falls, all of N.J.

Filed Sep. 5, 1978, Ser. No. 939,761
Int. Cl.[2] A63B *49/05, 49/02*
U.S. Cl. 273—73 E **8 Claims**

1. An adjustable throatless tennis racquet comprising:

(a) a frame including a handle portion and a head portion, said frame comprising:

(1) two similar members each formed of hollow material and including surfaces extending parallel and disposed in spaced relationship with respect to one another;

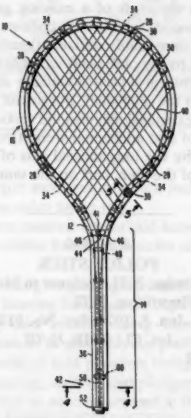
(2) a plurality of spacers positioned between said parallel surfaces to maintain the spaced relationship therebetween;

(3) retaining means for holding said members fixedly in spaced relation with respect to one another, said retaining means including a wrap means extending transversely about both of the said similar members at a plurality of locations along said head portion of said frame, said retaining means also including a plurality of pin means fixedly secured to each of said similar members in said handle portion of said frame;

(4) a plurality of rotatably mounted sheaves positioned in said head portion of said frame between said parallel surfaces of said members; and

(5) a grip means extending about said two similar members in said handle portion;

(b) diagonal stringing means positioned extending around each of said rotatable sheaves to form a diagonally strung



hitting surface within said head portion wherein the strings are free to move axially during contact with a ball, said stringing also being fixedly secured to a movable means for tension adjustment;

(c) tensioning means for adjusting the tension of the diagonal stringing including:

(1) a connector member being located between said parallel surfaces of said similar members in said handle portion adjacent said diagonal stringing means, said connector member being fixedly secured to the ends of said diagonal stringing means to be movable therewith laterally or longitudinally with respect to said handle portion;

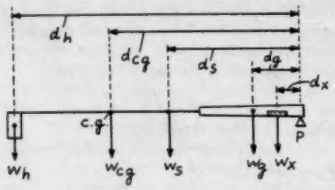
(2) a flexible wire means fixedly secured to said connector to allow lateral movement thereof; and

(3) an adjuster means rotatably mounted to the bottom end of said handle portion, said adjuster means being connected to said flexible wire means to adjust the amount of tension thereon to cause axial movement of said connector member to vary the tension on said diagonal stringing means.

4,203,598
GOLF CLUB

Alfred Stuff, Ridgewood, and Anthony Pellizzi, Franklin Lakes, both of N.J., assignors to Square Two Golf Corporation, Fairfield, N.J.

Division of Ser. No. 503,474, Sep. 5, 1974, Pat. No. 4,058,312.
This application Oct. 17, 1977, Ser. No. 842,538
Int. Cl.[2] A63B *53/00*
U.S. Cl. 273—77 A 5 Claims

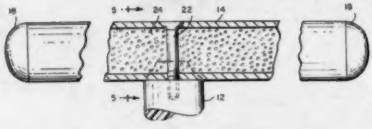


1. A method of minimizing or eliminating the axial torquing forces exerted on the shaft of a moving golf club, the club being an iron or wood, which club consists of a shaft, a grip and a club head immovably affixed thereto which method comprises affixing to the club shaft an additional weight component W_x at a position which is radially displaced from the longitudinal axis of the club shaft, proximate to the grip end of the shaft, and not extending beyond the surface of the grip, the center of gravity of said additional weight component lying in the plane defined by the longitudinal axis of the shaft and the center of gravity of the club, and on the same side of the shaft as the club head.

4,203,599
POLICE STICK

Paul D. Starrett, Rindge, N.H., assignor to Monadnock Lifetime Products, Inc., Fitzwilliam, N.H.

Filed Jun. 8, 1978, Ser. No. 913,891
Int. Cl.[2] F41B *15/02*
U.S. Cl. 273—84 R 3 Claims



1. A police stick comprising a hollow, elongate metal tube of uniform circular cross section containing at its ends internal threading, said tube being comprised of an aluminum alloy of alluminum and titanium and having a wall thickness of approximately 0.120 inches, and hemispherical end caps corresponding in diameter to the diameter of the tube provided with threaded neck portions for screwing the caps into the threaded ends of the tube, said caps being comprised of solid, rigid plastic, a body of vibration-absorbent, cellular, resinous plastic material such as foamed polyurethane completely filling the tube so as to have intimate interfacial contact with the interior surface of the tube from end to end, said tube containing diametrically-aligned holes, a handle comprised of a solid, rigid plastic containing at one end a diametrically-disposed, concave, arcuate recess corresponding in radius of curvature to the radius of curvature of the tube and of such depth that, when disposed at right angles to the tube, its concave ends extend more than a quarter of the way around the tube, but less than half the way around, said concave end containing an internally threaded axial hole and a screw bolt extending through the diametrically-aligned holes into the threaded hole in the handle fixing the handle to the tube, said handle when fixed to the tube being located nearer one end than the other so as to divide the tube into a short length at one side of the handle which, in conjunction with the handle, provides means for manipulation of the stick and a longer length at the other side by means of which the execution of a maneuver may be accomplished and said handle having at its distal end a hemispherical knob and between the knob and the affixed end, a grip-enhancing surface.

2. The method of making a police stick comprising providing a length of metal tube, threading the opposite ends interiorly to receive threaded closure caps, filling the tube with a mixture of ingredients which when activated will form a body of foam within the tube to completely fill the same, screwing a threaded cap into the opposite end and securing a rigid handle to the tube at right angles to the axis thereof prior to filling the tube with a foam-producing material.

4,203,600
TARGET WITH REMOVABLE SCORE SHEET

Stephen D. Brown, 5765 N. Butman Rd., Rte. 4, Gladwin, Mich. 48624

Filed Dec. 30, 1977, Ser. No. 865,896
Int. Cl.[2] F41J *1/10, 3/00*
U.S. Cl. 273—407 4 Claims

1. A target comprising:

(a) a flat, planar score sheet with indicia imprinted thereon having substantially the same configuration and position as the internal organs of an animate object;

(b) a main body simulating the form of an animate object, said body having a construction which reduces the speed of a projectile impacting thereagainst or penetrating there into;

(c) the main body having a normally open vertical slot, said slot having a rectangular cross section in the horizontal plane defining means for removably receiving and retaining said score sheet, said slot being dimensioned greater than the score sheet and extending between portions of the main body such that emplacement of the score sheet within the slot substantially hides the score sheet from the view of the user;

(d) means within said slot for draining the slot; said main body being constructed from material of such thickness and density that a projectile penetrating the main body will traverse the slot and the score sheet emplaced there within.

4,203,601

ARROWHEAD

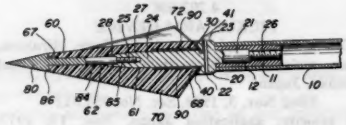
Miroslav A. Simo, Riverside, Ill., assignor to New Archery Products Corp., Riverside, Ill.

Continuation-in-part of Ser. No. 853,488, Nov. 21, 1977, which is a continuation-in-part of Ser. No. 738,030, Nov. 2, 1976, Pat. No. 4,093,230, which is a continuation-in-part of Ser. No. 619,824, Oct. 6, 1975, Pat. No. 4,006,901. This application May 30, 1978, Ser. No. 910,120

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] F41B 5/02

U.S. Cl. 273—421 27 Claims



1. An arrowhead assembly for attachment to the head end of an arrow shaft comprising:

an adapter shaft having a head end and tail end, said tail end having fastening means for securement to said head end of an arrow shaft and means for fastening a nosepiece at said adapter shaft head end;

an arrowhead body forming a hollow cylinder, said hollow cylinder having a diameter greater than said adapter shaft providing freely rotatable movement when said adapter shaft is inserted in said hollow cylinder;

a tapered nosepiece having a fastening means at its tail end for mating with said fastening means in the head end of the adapter shaft fastening said nosepiece in fixed relation to said adapter shaft and said arrow shaft.

4,203,602

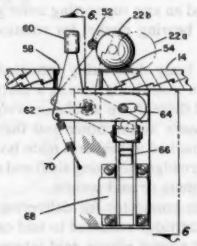
BALL BUMPER

Fred G. Kral, Lake Villa, Ill., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 1, 1977, Ser. No. 820,908

Int. Cl.[2] A63D 3/02

U.S. Cl. 273—121 A 8 Claims



1. In a bumper mechanism for a ball rolling game utilizing a conductive metal ball or the like for rolling over a playing surface, the combination comprising:

a plurality of post members secured to the playing surface;

a resilient conductive member suspended by said post members in spaced generally parallel relation with said playing surface at a height for impacting by the ball, a suspended portion of said conductive member yielding upon impact of a ball traveling in a first direction;

a conductive area on said playing surface in spaced relation with and in proximity to said conductive member;

ball propelling means including a ball kicker arm in spaced relation with said conductive member on the side opposite the ball impacting side and a solenoid having an armature for actuating said ball kicker arm to redirect the ball upon impact of the kicker arm with said conductive member in a direction generally opposite to said first direction; and

circuit means for energizing said solenoid, said circuit means including capacitor means charging in response to simultaneous contact of the ball with said conductive member and said conductive area and power amplifier means responsive to discharging of said capacitor means for energizing the coil of said solenoid to drive said armature through a full stroke regardless of the duration of contact of the ball with said conductive member and said conductive area.

4,203,603

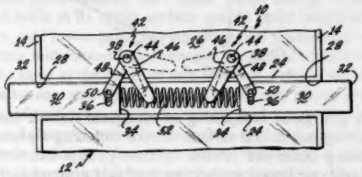
PINBALL FLIPPER MECHANISM

Yukio Konta, Gardena, Calif., assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,775

Int. Cl.[2] A63B 71/00

U.S. Cl. 273—129 W 4 Claims



1. A pinball flipper mechanism which includes:

a housing having sides and a top,

a playing platform located within said housing, said platform having a top visible from the exterior of said housing and a bottom,

an elongated bearing extending between said sides of said housing, said bearing having ends exposed at said sides of said housing, said bearing being located adjacent and below said bottom of said playing platform,

two plungers, each of said plungers being slidably mounted within said bearing, each of said plungers having an accessible end located so as to be accessible from the exterior of said housing at a side thereof, each of said plungers having an interior end located within said bearing adjacent to the bottom of said platform, said interior ends within said bearing being spaced from one another,

a single spring means located within said bearing between said adjacent ends of said plungers for biasing said plungers so that they extend outwardly from said sides of said housing,

two openings extending through and substantially perpendicular to said platform adjacent to said bearing, said openings being spaced from one another,

two bell crank levers, each of said bell crank levers having a centrally located apex and first and second elongated arms, said first elongated arm serving as a flipper and being located adjacent said top of said platform and said second arm being located adjacent said bottom of said platform, said arms extending from said apex, each of said bell crank levers being positioned so that its apex extends through one of said openings

two pivot means, one of said pivot means supporting the apex of one of said levers for rotation about an axis extending through its apex which is perpendicular to said platform, the other of said pivot means supporting the apex of the other of said levers for rotation about an axis extending through its apex which is perpendicular to said platform, and

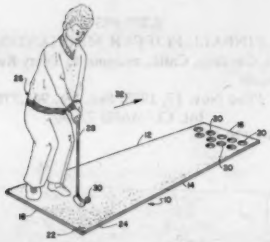
two separate pin and slot sliding connection means, a pin and slot sliding connection means connecting each of said second arms with one of said plungers,

said pin and slot sliding connection means permitting said accessible ends of said plungers to be moved generally toward said sides of said housing so as to cause rotation of said bell crank levers.

4,203,604
GOLF GAME

Mark La Grange, R.R. #51-Box 500, Terre Haute, Ind. 47805

Filed Sep. 30, 1977, Ser. No. 838,104
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 FB **5 Claims**

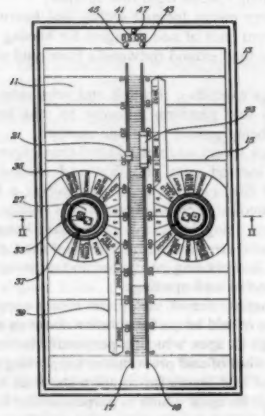


1. A golf game comprising an elongated flexible mat, said mat having one lateral surface thereof including a plurality of upstanding blade-like bristles uniformly disposed along the entire said one lateral surface, each of said upstanding bristles simulating closely cropped and evenly cut grass, the other lateral surface of said mat being substantially smooth, a plurality of holes being located adjacent one marginal edge of said mat, a plurality of flexible sheets, said plurality of flexible sheets fixedly secured to said other lateral surface of said mat at the locations of said plurality of holes, said plurality of sheets each carrying indicia, said indicia being visibly accessible through said plurality of holes.

4,203,605
FOOTBALL GAME

Joe W. Moody, 2306 W. 10th, Irving, Tex. 75060

Filed Oct. 30, 1978, Ser. No. 955,886
Int. Cl.[2] A63F *3/00, 9/04*
U.S. Cl. 273—247 **8 Claims**



1. In a simulated football game apparatus having a board with a simulated football field thereon, ball marker means, first down yardage indicator means, and a pair of dice for determining by chance movement of the ball, an improved selector means for indicating downs and plays, comprising:

a pair of cups rotatably carried by the board, one for the offense player and the other for the defense player; each cup being adapted to receive a die thrown by a player;

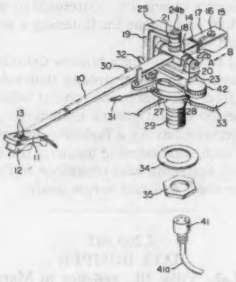
markings formed on the board about each cup defining areas containing indicia that indicate downs and plays; and

indicator means on each cup for indicating which area has been selected by rotation of the cup, allowing penalties to be applied for failure to rotate the cup to the proper area before a play, and for failing to retain thrown dice in the cup.

4,203,606
PICKUP ARM DEVICE

Shuichi Obata, Kyoto, and Takayuki Sugihara, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1978, Ser. No. 957,312
Claims priority, application Japan, Nov. 17, 1977, 52-155194[U]
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—23 R **3 Claims**



1. A pickup arm device comprising

(a) a rotary bearing adapted to be mounted on a record player, said bearing comprising an arm base, a first bearing gimbal fixed to said arm base, a second bearing gimbal mounted on said first bearing gimbal for rotation about a vertical axis, and an arm supporting inner gimbal mounted on said second bearing gimbal for rotation about a horizontal axis,

(b) an arm main body detachably mounted on said inner gimbal, said arm main body having a cartridge mounting shell at one end thereof and a balance weight for controlling stylus pressure at the other end thereof, said inner gimbal being attached to said arm main body at a position between said cartridge mounting shell and said weight and relatively proximate to said weight,

(c) an intermediate connector for delivering output signals from a pickup cartridge mounted to said cartridge mounting shell to said record player, said intermediate connector having an output terminal and being mounted on the portion of the arm main body attached to said inner gimbal, said connector being adapted to be connected to said pickup cartridge and a delivering terminal attached to said inner arm gimbal and adapted to be connected to a circuit of said record player, said terminals being slidably electrically connected to each other at a region including said horizontal axis; and

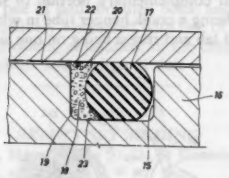
(d) a lock nut for detachably securing the attached portion of said arm main body to said inner gimbal; whereby said arm main body is freely mounted on and easily removable from said inner gimbal by said lock nut without disassembling said bearing gimbals.

4,203,607

HIGH PRESSURE, FLUID TIGHT SEAL

Emmet F. Brieger, Nogal, N. Mex. 88341

Filed Dec. 1, 1976, Ser. No. 746,601
Int. Cl.[2] B65D *53/00*; F16J *15/00*
U.S. Cl. 277—188 A 5 Claims



1. A sealing mechanism for improving the sealing effect of O-rings comprising:

telescoping members where one of said members has a groove for receiving a sealing element therein;

a sealing element in said groove, said sealing element is an O-ring disposed under compression between said telescoping members;

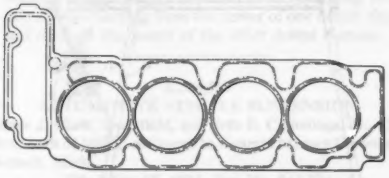
a flowable material disposed between said sealing element and on side wall of said groove, particulate grit material disposed in said flowable material and sized to block off the clearance space between said members upon the application of pressure to the sealing element, said flowable material is a viscous paste.

4,203,608

CORRUGATED GASKETS

Terence P. Nicholson, Calf Hall, Muggleswick, nr. Derwentside, Co. Durham, England

Filed Aug. 2, 1978, Ser. No. 930,429
Claims priority, application United Kingdom, Feb. 2, 1978, 4350/78
Int. Cl.[2] F16J *15/08*
U.S. Cl. 277—235 B 3 Claims



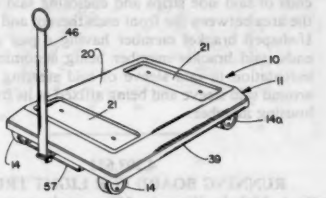
1. A gasket effecting a seal between two planar surfaces lying in opposition of each other comprising a sheet like member having in cross section a double wave form corrugation terminating in coplanar oppositely extending flanges defining the base plane of said gasket, the distance between the plane in which the crests of the two waves are contained and a plane parallel thereto in which the trough between said two waves is contained is significantly less than the distance between the plane of the crests and the base plane, said gasket being deformable on application of compressive forces normal to said planes to cause said oppositely extending flanges to move apart while maintaining the relative distance between said crest of said wave form.

4,203,609

TRANSPORT VEHICLE

Terry L. Mitchell, Jenison, and David A. Immink, Holland, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Jul. 31, 1978, Ser. No. 929,737
Int. Cl.[2] B62B *7/04*
U.S. Cl. 280—47.11 10 Claims



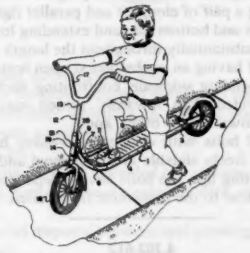
1. A transport cart having a platform, said platform having upper and lower panels, said upper panel having a pair of recessed wells in its upper surface spaced apart lengthwise of said cart, said lower panel having elongated upstanding ridges alternating with depending channels; the height of said ridges being the same as the depth of said recessed wells in said upper panel, whereby said upper panel rests on said ridges and the bottoms of said recessed wells rest on said lower panel; said ridges and channels extending lengthwise of said cart with the ridges being of a length to be received between said recessed wells; said upper and lower panels each having a depending peripheral flange, the flange of said lower panel being nested within the flange of said upper panel; said panels being secured to each other to form said platform into a rigid sandwich; supporting wheels secured to said sandwich at each of the corners thereof.

4,203,610

SCOOTER

Nicholas Mihalik, 98-25 65th Rd., Forest Hills, N.Y. 11374

Filed Oct. 10, 1978, Ser. No. 949,668
Int. Cl.[2] B62B *7/00*
U.S. Cl. 280—87.04 R 2 Claims



1. A scooter, comprising

a board-like platform having spaced opposite front and rear ends and a pair of side strips affixed to opposite lengthextending edges of said platform, said side strips being curved in a slight arcuate upturn extending from the front end of the platform and having free front ends substantially perpendicular to the plane of the platform but spaced in front of said platform, said side strips extending from the rear end of said platform to a distance therebeyond;

a steering shaft having spaced opposite top and bottom ends;

a sleeve coaxially surrounding said shaft and an annular indentation formed in said sleeve in the area of the bottom end of said shaft;

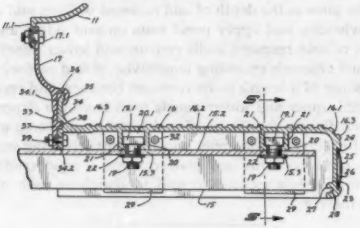
a front wheel rotatably mounted at the bottom end of the steering shaft;
handle bars affixed to the top end of the steering shaft;
a rear wheel rotatably mounted between the side strips at the rearmost parts of said side strips; and
coupling means for coupling the sleeve of the steering shaft to said side strips, said coupling means comprising a pocket-like housing member accommodating the free front ends of said side strips and enclosing said side strips and the area between the front ends thereof and a substantially U-shaped bracket member having a pair of spaced free ends, said bracket member being accommodated in the indentation in said sleeve of said steering shaft, passing around said sleeve and being affixed at its free ends to said housing member.

4,203,611

RUNNING BOARD FOR LIGHT TRUCKS

Martin A. Makela, Waconia, Minn., assignor to J-Mark, Inc., Minneapolis, Minn.

Filed Jul. 10, 1978, Ser. No. 923,304
Int. Cl.[2] B60R *3/00*
U.S. Cl. 280—163 **18 Claims**



1. A running board for attachment to the frame of light trucks, comprising
an elongate deck to extend along the cab of the truck,
means mounting the deck to the truck frame and including a plurality of elongate frame arms underlying the deck and extending transversely thereof,
the deck having a bottom side overlying the frame arms and also having a pair of elongate and parallel rigid mounting channels on said bottom side and extending longitudinally along and substantially throughout the length of the deck, the channel having an unobstructed open bottom and also having depending sidewalls confronting each other and being provided with inwardly turned supporting lips extending toward each other, and
a plurality of bolts with enlarged flat-sided heads fitting snugly and freely slidable in the channel and carried on said supporting lips, the bolts having depending threaded shanks secured to the transverse frame arms.

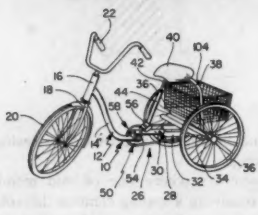
4,203,612

VELOCIPEDE HAVING SEPARABLE FRAME PARTS

Roger H. Feikema, 6050 Palmer Blvd., Sarasota, Fla. 33582

Filed Jun. 22, 1978, Ser. No. 917,905
Int. Cl.[2] B62K *13/04, 19/18*
U.S. Cl. 280—287 **3 Claims**

1. A separable frame velocipede comprising: a velocipede frame having front and rear frame parts including a separable coupling releasably interconnecting said frame parts in normal operative position of said frame and releasable for separting said frame parts from each other, said coupling having generally horizontally spaced front and rear portions and including first and second coupling members, one for each of said frame parts, said members being operatively fixed to the associated frame part, the first coupling member having an upwardly opening cradle snugly receiving a complementary portion of the second coupling member in said normal operative position of said frame, said cradle and said complementary portion being generally semi-cylindrical with substantially concentric, generally horizontal axis extending crosswise of said frame, one of said members having a tab releasably received in a recess in the other member, said coupling having releasable means restraining said members against relative horizontal movement, said complementary portion of said second coupling member being a crank hanger tube in which said crank is journalled, said tab and recess being on one side of said crank



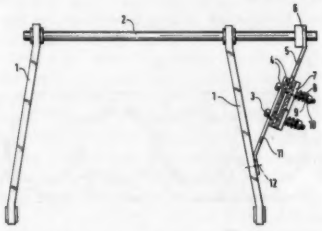
hanger tube, said releasable means being on the other side of said crank hanger tube; said tab being integral with said cradle and extending forwardly therefrom, said recess being a generally horizontally extending slot in the rear face of said crank hanger tube and said tube including an integral depending flange extending inwardly of said tube and engaging said tab in said normal operative position of said frame, and said releasable means including a pair of plates, a first of said plates being integral with and extending upwardly from the front of said cradle, and said plates having cooperating means aligning said coupling members crosswise of said velocipede frame.

4,203,613

ADJUSTING DEVICE FOR THE DRAFT LINK OF A THREE-POINT MOUNTING DEVICE

Dieter Kunze, Siegburg, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,605
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 2738951
Int. Cl.[2] A01B *59/043*
U.S. Cl. 280—460 A **3 Claims**



1. An adjustable device for the draft link of a three-point mounting system for supporting agricultural implements upon an agricultural tractor, said adjusting device comprising a longitudinally adjustable bipartite strut assembly having a pair of ends, with one of said ends being connected in an articulated manner to said draft link of said tractor and with the other of said ends being connected to a fixed point on said tractor, said strut assembly comprising: two partially overlapping connecting arms; means joining said two connecting arms together in frictional engagement for movement relative to each other; means defining an elongated slot having a pair of ends on one of said connecting arms along a portion thereof in overlapping

relationship with the other of said connecting arms; means defining at least two screw-receiving holes in the other of said connecting arms; a pair of threaded bolts extending through said elongated slot of said first connecting arm and through said receiving holes of said first connecting arm and through said receiving holes of said other connecting arm; a pair of compression springs one each arranged respectively at one of said ends of said slot, each of said springs being compressively engaged against one of said threaded bolts; and a pair of set-screws each operatively associated with one of said compression springs for enabling adjustment of the compressive force of said springs within said elongated slot.

4,203,614

SAFETY SKI BINDING

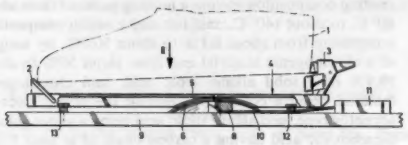
Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,347

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732120

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—637 **13 Claims**



1. A safety ski binding for releasably interconnecting a skiing boot and a ski, said binding comprising:

a cable (**10**) connectable at one end to a skiing boot and at the other end to a ski (**9**);

a mounting fixture (**4**) for the skiing boot releasably securable to the ski approximately in a middle portion thereof and connected to said cable;

detent elements (**5,6**) positioned between said mounting fixture and the ski for holding the skiing boot in skiing position on the ski; and

a tensioner (**11**) connected to said cable for loading said cable to thereby hold said detent elements in engagement with each other, said detent elements comprising a base segment having an at least partially arcuate-shaped exterior surface and a cup having a surface mating with the exterior surface of said base segment, one of said detent elements being connected to the ski and the other detent element being fixedly connected to the mounting fixture, said cable extending from the center of one detent element and through the center of the other detent element.

4,203,615

AUTOMOTIVE VEHICLE SUSPENSION

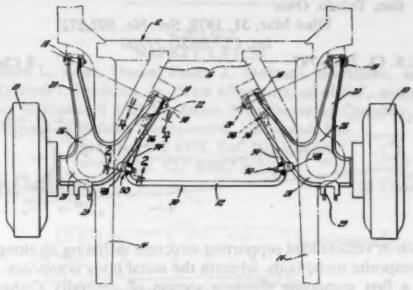
Casimer J. Cislo, Southfield, and Seth B. Cummings, Jr., Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1978, Ser. No. 943,374

Int. Cl.[2] B60G *3/14*

U.S. Cl. 280—689 **4 Claims**

1. In a vehicle including transversely opposite road wheels, spring suspension therefor comprising, a pair of control arms each mounted at an inboard end thereof on the vehicle sprung mass to swing on an axis extending at an angle to a transverse plane of the latter and mounting at the outboard end thereof a respective road wheel, a stabilizer member including a main portion extending transversely of the vehicle and crank arm portions each turned from the main portion to extend toward connection with a respective control arm, and means for mounting opposite ends of said stabilizer member on the vehicle for roll stabilization of the vehicle sprung mass and including first means mounting the crank arm portion on a respective control arm and second means including a swingable link connected with the crank arm portion of the stabilizer member



at a location spaced from the first means and whereby said link may swing to preclude resistance by said stabilizer member to pitch and ride motion of the vehicle sprung mass.

4,203,616

AIR BAG DEVICE FOR CARS

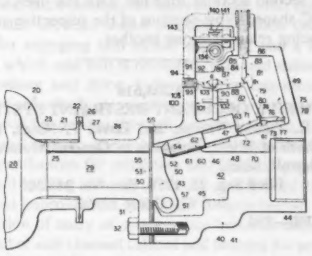
Motohiro Okada, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1977, Ser. No. 854,337

Claims priority, application Japan, Aug. 2, 1977, 52/12882

Int. Cl.[2] B60R *21/08*

U.S. Cl. 280—737 **3 Claims**



1. An air bag device, comprising:

a container for being charged with a gas under pressure;

said gas container including an opening portion communicating with an air bag;

a pressing lid;

said pressing lid being provided in a passage connecting said opening portion of said container with an inlet of the air bag;

a frangible lid disposed between said pressing lid and said gas container;

said opening portion of said gas container being tightly sealed by said frangible lid;

said frangible lid being supported on one surface thereof by a pressing surface of said pressing lid;

said pressing lid being provided with an area contacting said frangible lid which is larger than is necessary to prevent fracture of said frangible lid by said gas under pressure;

a link mechanism for applying pressure to said pressing lid;

impact detecting means for releasing said link mechanism; and

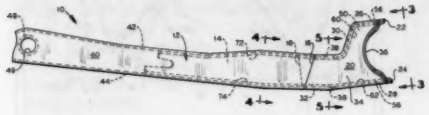
a recess formed in said pressing surface of said pressing lid contacting said one surface of said frangible lid, and provided with a small hole making the space within said recess communicate with said passage.

4,203,617

VEHICLE LOAD SUPPORTING STRUCTURE

Miles A. Bowman, Jr., Reading, Pa., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 31, 1978, Ser. No. 892,272
Int. Cl.[2] B62D *21/00*
U.S. Cl. 280—797 5 Claims



1. A vehicle load supporting structure including an elongate composite metal body wherein the metal body comprises:

a first composite elongate section of generally C-shaped cross-section having a pair of spaced apart flanges and an interconnecting web defining an open channel, said section including at least two adjacent welded together portions, one portion having a predetermined yield strength, the other portion having a yield strength different from the yield strength of the first mentioned portion;

a second composite elongate section of generally C-shaped cross-section having a pair of spaced apart flanges and an interconnecting web defining an open channel, including at least two adjacent welded together portions, one portion having a predetermined yield strength, the other portion having a yield strength different from the yield strength of the first mentioned portion; and

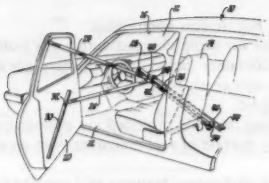
means for securing free edges of the flanges of said first and said second sections together with the open channels of the C-shaped cross-sections of the respective sections are in facing relation to one another.

4,203,618

PASSIVE OCCUPANT RESTRAINT SYSTEM

William R. Frank, Warren, and David F. Manz, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1978, Ser. No. 945,309
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—804 3 Claims



1. In a motor vehicle body having a door mounted laterally adjacent an occupant seat, a passive seat belt system comprising:

a restraint belt of fixed length having an outboard end attached to the vehicle door and an inboard end attached to the vehicle body forwardly of the seat;

a track extending longitudinally of the vehicle body inboard the occupant seat;

a belt carriage movable along the track and slidably receiving the belt intermediate the inboard and outboard ends, said carriage being movable along the track between a forward position stowing the belt forwardly of a seated occupant and a rearward position establishing the belt in a restraining position closely adjacent the seated occupant;

spring means urging the carriage toward the rearward position;

opening movement of said door causing the outboard end of the belt to be moved outwardly and forwardly whereby sliding movement of the belt through the belt carriage causes movement of the belt carriage to the forward position to stow the belt.

4,203,619

PRODUCTION OF PRESSURE-SENSITIVE CARBONLESS RECORD SHEETS USING ALKANE DIOIC ACID HOT MELT SYSTEMS AND PRODUCTS THEREOF

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 869,995, Jan. 17, 1978, abandoned. This application Feb. 14, 1979, Ser. No. 11,964
Int. Cl.[2] B41M *5/22*
U.S. Cl. 282—27.5 13 Claims

1. A process for producing a pressure-sensitive carbonless record sheet comprising the steps of:

(a) preparing a hot melt coating composition, said hot melt coating composition having a melting point of from about 60° C. to about 140° C., said hot melt coating composition comprising from about 0.1% to about 50.0%, by weight, of a chromogenic material and from about 50% to about 99.9% of a solid alkane dioic acid, said chromogenic material being a color developer of the acidic electron acceptor type, said alkane dioic acid being a water soluble dicarboxylic acid having a carbon chain of at least 5 carbon atoms;

(b) heating said hot melt coating composition to a temperature above the melting point of said hot melt coating composition;

(c) applying said heated coating composition to a substrate, said coating composition being applied at a coat weight of from about 0.2 pounds to about 8.0 pounds per 3300 square feet of substrate, and

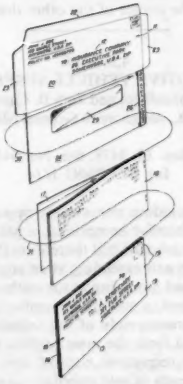
(d) setting said coating composition by cooling said coated substrate.

4,203,620

AIR TRAVEL INSURANCE ASSEMBLAGE AND METHOD OF VALIDATING

Leonard L. Long, The Darlington, Suite 7, 2025 Peachtree Rd., NE., Atlanta, Ga. 30309

Filed Sep. 11, 1978, Ser. No. 940,943
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—23 16 Claims



1. For use with a conventional air travel ticket as a means to

facilitate the validation of air travel insurance, an air travel insurance documents assembly, said insurance documents assembly including an institutional trust mailing element, a beneficiary mailing element, a double-active face duplicating sheet at one side of said institutional trust mailing element and a single-active face duplicating sheet between the institutional trust mailing element and the beneficiary mailing element, and a return envelope having a positioning means on one panel thereof for said insurance documents assembly and an air travel ticket, the opposite side of such panel having an area to receive written air travel indicia, said air travel insurance documents assembly being adapted to be temporarily interleaved with an air travel ticket by placing the assembly beneath the first copy of the ticket, the documents assembly and ticket then being engaged as a unit with said positioning means of the return envelope to be held thereby while the insurance purchaser writes said air travel indicia in said area, said assembly and ticket then being separated from the positioning means and from each other, and the insurance documents assembly having its elements separated, whereby the institutional trust mailing element and beneficiary mailing element can be separately mailed and the return envelope can be mailed with payment to an insurance company or agent, validation of the air travel insurance being completed when said first copy of the air travel ticket with said air travel indicia thereon is delivered to and accepted by a ticket agent.

4,203,621

LOCK IN PARTICULAR FOR AN AUTOMOBILE VEHICLE

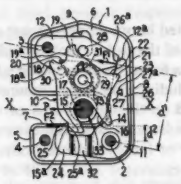
Jean P. Noel, and Marcel Party, both of Saint-Die, France, assignors to Compagnie Industrielle de Mecanismes, France

Filed Aug. 31, 1978, Ser. No. 938,498

Claims priority, application France, Sep. 12, 1977, 77 27497; Jul. 18, 1978, 78 21260

Int. Cl.² E05C 3/26

U.S. Cl. 292—216 **15 Claims**



1. A lock, in particular for an opening element of an automobile, comprising a pivotal fork member which has a projecting portion and is movable between an unlocking position and a locking position, means combined with the fork member for resiliently biasing the fork member to the unlocking position thereof, detent means carried by an arm of a pivotal first lever having a first arm and a second arm and movable between a retaining position and a releasing position relative to said projecting portion of the fork member and means for biasing the pivotal lever towards its releasing position by an effect of an unlocking force exerted on the fork member, and a second lever mounted to pivot between a first position and a second position, means for resiliently biasing the second lever towards its first position, the second lever being capable of blocking an end of the second arm of the first lever in the first position of the second lever when the first lever is in the retaining position of the first lever, and the second lever being capable of releasing said end of the second arm in the second position of the second lever, means operatively connected to the second lever for shifting the second lever to the second position of the second lever, the fork member comprising two successive projecting portions, the fork member carrying means defining a cam surface, the second lever having a projecting portion with which projecting portion the cam surface is cooperative so as to cause the second lever to move temporarily to the second position of the second lever when the second projecting portion of the fork member approaches the detent means in the course of a locking movement of the fork member.

4,203,622

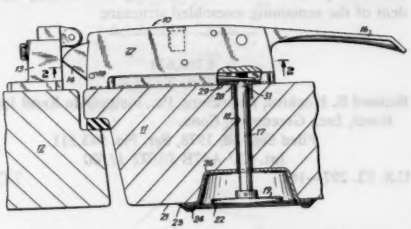
SAFETY LATCH

Sanford L. Cook, Ocean; Justin J. Molisani, Bricktown, and Kenneth I. Dennison, Jr., West Allenhurst, all of N.J., assignors to Standard Keil Hardware Manufacturing Company, a Division of Buildex Incorporated, Allenwood, N.J.

Filed Dec. 26, 1978, Ser. No. 973,264

Int. Cl.² E05C 3/22

U.S. Cl. 292—221 **15 Claims**



1. An improved latch suitable for use on the door of a walk-in refrigerator cabinet, said latch including a latch mechanism and housing therefor, a retractable bolt in said housing for engaging a striker assembly attached to the jamb of said cabinet, a retractor handle pivotably mounted to said housing for operating said latch mechanism to retract said bolt, said handle being movable between seated position in which said bolt is extended for engaging said striker assembly and a retracted position in which said bolt is retracted from said striker assembly for opening said door, locking means mounted to said housing for selectively preventing retraction of said handle, and a pushrod for passing through a corresponding channel in said door and into an opening in said housing for activating said latch mechanism for retracting said bolt independently of whether said locking means is in locked or unlocked condition, wherein said improvement comprises a vapor barrier disposed for prevention of entry of water vapor between said pushrod and the wall of said channel cabinet and thereby for prevention of frost buildup which could interfere with the operation of said pushrod.

4,203,623

BUS CONSTRUCTION

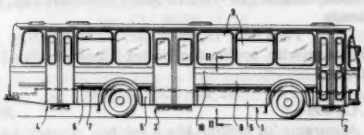
Hans Fenner, Evilard; Wilhelm Auwärter, Gümlingen, and Karl-Heinz Stark, Muttenz, all of Switzerland, assignors to Ramseier & Jenzer AG, Carosseriewerke Bern, Bern, Switzerland

Filed Oct. 3, 1977, Ser. No. 838,988

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715550

Int. Cl.² B62D 31/02, 47/02

U.S. Cl. 296—178 **15 Claims**



1. A bus with a chassis; a structure fastened to said chassis and enclosing the passenger area; said structure having sidewalls above the bottom of the bus and having a longitudinal

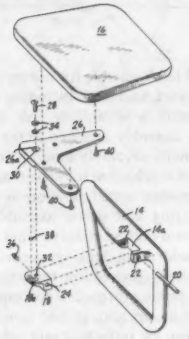
carrier section, said sidewalls having door cutouts, said longitudinal carrier being interrupted only by the door cutouts, columns connecting to said longitudinal carrier, said longitudinal carrier section being divided into a fixed supporting inside shell and a non-supporting substantially replaceable outside shell, said outside shell comprising covering means; only said inside shell having a supporting function; said outside shell being replaceable; said inside shell and said outside shell comprising plate-shaped members; said outside shell being spaced and offset from said inside shell so that said inside shell is protected from damage in accidents involving the bus, said outside shell being replaceable after damage thereto without affecting the inside shell and remaining structure of the bus, disassembly of the outside shell being substantially independent of the remaining assembled structure.

4,203,624

WRITING TABLET

Richard B. Hopkins, Pennsburg, Pa., assignor to Knoll International, Inc., Greenwich, Conn.

Filed Sep. 18, 1978, Ser. No. 943,111
Int. Cl.[2] A47B *39/00, 11/00*
U.S. Cl. 297—162 **7 Claims**



1. A writing tablet for a chair arm or the like comprising a pivot swivel block, first mounting means for mounting said pivot swivel block to said chair arm or the like for pivotal movement about a first axis, a tablet panel support, second mounting means for mounting said tablet panel support to said pivot swivel block for pivotal movement about a second axis perpendicular to said first axis, a first semicircular slot in said pivot swivel block, a second semicircular slot in said tablet panel support, and a ball riding simultaneously in said slots limiting the amount of movement of said tablet panel support about said second axis.

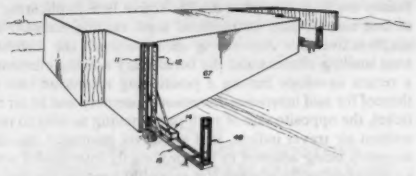
4,203,625

APPARATUS FOR SULFUR MELTING BY LATERAL DISPLACEMENT OF HEATING ELEMENT

Ernest R. Ellithorpe, and Richard C. Ellithorpe, both of Calgary, Canada, assignors to Western Sulfur Remelters Ltd., Calgary, Canada

Filed May 15, 1978, Ser. No. 906,197
Claims priority, application United Kingdom, May 17, 1977, 20629/77
Int. Cl.[2] E21C *41/14*
U.S. Cl. 299—6 **20 Claims**

1. Apparatus for melting block sulphur, comprising:
a heating element for applying heat to the sulphur;
said heating element comprising an array of mutually spaced and parallel pipes, inlet means for directing a flow of steam through said pipes and outlet means for the discharge of steam and condensate from said pipes;
means for supporting said heating element in an at least approximately upright disposition; and



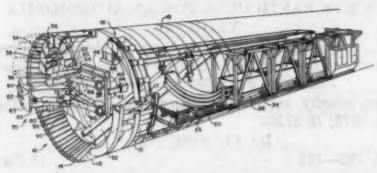
means for advancing said heating element in said disposition and in a direction at least approximately parallel to the ground towards the sulphur.

4,203,626

ARTICULATED BOOM-DIPPER-BUCKET ASSEMBLY FOR A TUNNEL BORING MACHINE

Herman Hamburger, Geneva, Ill., assignor to Zokor Corporation, Aurora, Ill.

Filed Feb. 21, 1979, Ser. No. 13,523
Int. Cl.[2] E21D *9/08*
U.S. Cl. 299—33 **12 Claims**

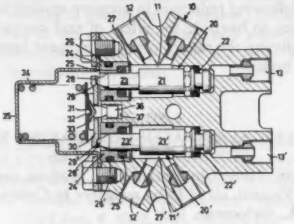


1. An articulated boom-dipper-bucket assembly for a tunnel boring machine of the type which includes a hollow cylindrical body having a front circular cutting edge and a central axis, an excavator including a bulkhead, mounting means for mounting the bulkhead on the central axis of the cylindrical body, moving means associated with the excavator for moving the bulkhead axially of the cylindrical body, and rotating means for rotating the excavator 360° about an axis coaxial with or parallel to the central axis, said assembly forming part of the excavator and including a base mounted on the bulkhead and having a front face facing axially toward the front of said machine, an elongate boom having a first inner end pivotally mounted to said base at one side thereof, an elongate dipper member pivotally mounted at a first end thereof to an outer second end of said boom and a bucket-scoop having an inner edge and an outer cutting edge and being pivotally mounted to a second outer end of said dipper member, first reciprocal power means pivotally connected at one end of said base at the other side thereof opposite said one side and pivotally connected at the other end to said boom at a point spaced from said inner end of said boom for moving said outer end of said boom about the pivot connection thereof to said base toward and away from said base, second reciprocal power means pivotally connected at one end to said first end of said boom and pivotally connected at the other end to said first end of said dipper member for moving said dipper member about the pivot connection thereof to said boom toward and away from the central axis of the cylindrical body and third reciprocal power means pivotally connected at one end to said first end of said dipper member and pivotally connected at the other end to said bucket-scoop and operable to pivot said bucket-scoop about the pivot connection thereof to said dipper member to move said outer cutting edge in a clawing action against material being removed by the tunnel boring machine.

4,203,627
PARALLEL PROPORTIONING VALVE FOR USE IN A DUAL BRAKING SYSTEM

Teruhisa Kono, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 31, 1978, Ser. No. 911,089
Claims priority, application Japan, Feb. 16, 1978, 53-17406
Int. Cl.² B60T 8/26
U.S. Cl. 303—6 C **4 Claims**



1. A parallel proportioning valve for use in a dual braking system comprising:

(a) a casing, said casing having a pair of fluid chambers each of said chambers having a fluid inlet for connection to a pressure source and a fluid outlet for connection to a brake means, said casing additionally having a hole in the center between said fluid chambers;

(b) a fluid pressure responsive plunger located in each of said fluid chambers;

(c) valve seat means located in fluid passages, said fluid passages defined as the path between said fluid inlets and said fluid outlets of each of said fluid chambers, said valve seat means provided for closing said fluid passages upon actuation of said fluid pressure responsive plungers by seating said plungers therein;

(d) an abutting plate located adjacent said fluid pressure responsive plungers and abutting one end of each of said fluid pressure responsive plungers;

(e) spring urging means acting on said abutting plate for urging said abutting plate to urge said fluid pressure responsive plungers into an open state in relation to said valve seat means; and

(f) a pin fixed to the center of said abutting plate and received in said hole in said casing and having a size relative to said hole for allowing inclination of said abutting plate due to differences in fluid pressure responsive plunger movement during normal operating conditions, said pin further having a shoulder there around having a biting edge thereon for biting into the surface of said casing when said abutting plate is urged by only one plunger in a direction to pull said pin out of said hole and preventing movement of said abutting plate away from said casing, whereby when one of said fluid pressure responsive plungers fails the valving operation of the remaining operative fluid pressure responsive plunger is disabled.

4,203,628
ANTI-BRAKE-VIBRATION TYPE PROPORTIONING VALVE

Takaaki Ohta, Okazaki, and Sadayoshi Ito, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 24, 1978, Ser. No. 936,502
Claims priority, application Japan, Jan. 3, 1978, 53-23281
Int. Cl.² B60T 8/26
U.S. Cl. 303—6 C **6 Claims**

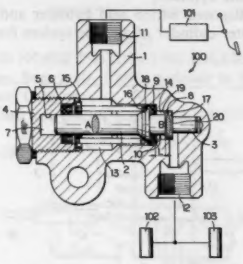
1. In a brake vibration preventing type proportioning valve for a hydraulic brake system, the valve comprising:

an inlet to be connected to a master cylinder of said brake system;

an outlet to be connected to at least one rear wheel brake cylinder of said brake system;

a cut valve arranged between said inlet and said outlet;

a piston controlling said cut valve being provided with on its inlet side a shaft which is of given cross section, is exposed to atmospheric pressure and provides a pressure receiving area corresponding to said cross section of said shaft, said piston being biased in a direction to open said cut valve by spring means, and being to close said cut valve at a predetermined pressure and to receive, with said cut valve closed, on a smaller effective surface thereof in cut-valve-opening direction inlet pressure and on a larger effective surface thereof in cut-valve-closing direction outlet pressure, the improvement wherein said piston of said proportioning valve has a stroke L between an inoperative position and the cut valve closing position which fulfills the condition:



$$L \geqq \frac{V}{A}\left(1 + \frac{P_4 - P_3}{2(P_5 - P_4)}\right),$$

wherein

V is the volume of fluctuation in the rear wheel brake cylinder which is caused by irregularities in the rotating members of the rear wheel brakes and which causes pressure fluctuations,

A is the cross-section area of said shaft,

P4 is the maximal pressure at which pressure fluctuations causing the brake vibration can occur,

P3 is the minimum pressure at which pressure fluctuations causing the brake vibration can occur,

P5 is the value of P4 raised by the amplitude of the pressure fluctuations, and

wherein the pressure at which said cut valve closes is equal to or greater than the pressure P5.

4,203,629
HYDRAULIC SERVO-BRAKE SYSTEM FOR ELECTRICALLY OPERATED VEHICLES

Ove Bodin, Box 54, 710 10 Fjugesta, Sweden

Filed Jul. 19, 1978, Ser. No. 926,198
Claims priority, application Sweden, Aug. 1, 1977, 7708751
Int. Cl.² B60T 13/16
U.S. Cl. 303—10 **4 Claims**

1. A hydraulic servo-brake system for an electrically driven vehicle, the vehicle including an hydraulically operated working element and having an hydraulic control system comprising:

pump means for providing a hydraulic medium under pressure;

an hydraulic supply line system for supplying pressurized medium from said pump means to at least one hydraulically operated mechanism in the vehicle;

a regulator valve for regulating the flow of hydraulic medium to the hydraulically operated mechanism;

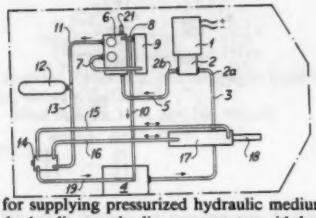
means for accumulating at least some of the hydraulic medium in said hydraulic supply line system; and

means for detecting the pressure of the medium in said supply line system and for controlling the operation of said pump means such that said pump means is actuated when a predetermined low-pressure value is detected in said supply line system and said pump means is deactuated when a predetermined high-pressure value is detected in said supply line system;

said hydraulic servo-brake system comprising:

an hydraulic cylinder;

a piston disposed within said cylinder and connected to the master cylinder of a brake system for the vehicle;



means for supplying pressurized hydraulic medium from said hydraulic supply line system to said hydraulic cylinder;

a control valve for controlling the volume of hydraulic medium supplied from said hydraulic supply line system to said hydraulic cylinder; and

a brake pedal for operating said control valve, said control valve being responsive to the position of said brake pedal such that the volume of hydraulic medium supplied to said hydraulic cylinder is proportional to the amount of depression of said pedal from a rest position, to thereby control the pressure of medium in said hydraulic cylinder in dependence upon the position of said brake pedal.

4,203,630

BRAKE CONTROL UNITS

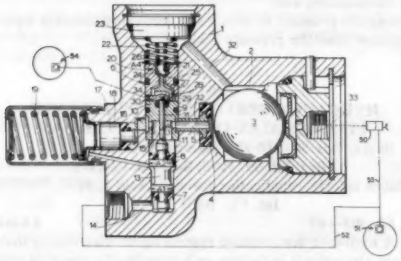
Alan G. Dixon, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Oct. 24, 1978, Ser. No. 954,282

Claims priority, application United Kingdom, Oct. 27, 1977, 44857/77; Mar. 22, 1978, 11271/78

Int. Cl.[2] B60T *8/14*

U.S. Cl. 303—24 C **12 Claims**



1. A brake control unit for a vehicle hydraulic braking system, said braking system including a master cylinder for applying pressure to front and rear wheel brakes, said brake control unit being adapted for incorporation between said master cylinder and at least one hydraulic actuator for said rear wheel brakes, said front wheel brakes being adapted to be applied directly by pressure from said master cylinder, said control unit incorporating an inertia-controlled valve, adapted to close when the deceleration of said vehicle exceeds a predetermined value, and an outlet port for connection to said hydraulic actuator, closure of said inertia-controlled valve being operative to ensure that any subsequent increase in pressure applied to said outlet port occurs at a lesser rate than that at which the pressure of said master cylinder increases, said control unit also incorporating pressure-responsive override means responsive to the pressure applied to said front wheel brakes, said override means being operative, after closure of said inertia-controlled valve and following reduction in pressure applied to said front wheel brakes, to override the effect of said inertia-controlled valve in reducing the rate of pressure increase applied to said rear wheel brakes.

4,203,631

HYDRAULIC SERVO-ASSISTED BRAKING SYSTEM FOR MOTOR VEHICLES

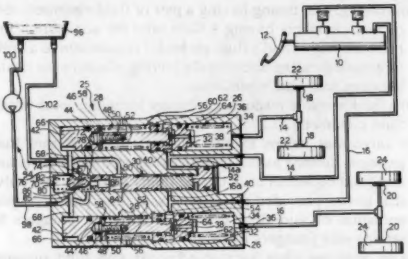
Enrico Rivetti, Turin; Giuseppe Amedei, Modena, and Antonino Bertone, Vercelli, all of Italy, assignors to Centro Richerche Fiat S.p.A., Orbassano, Italy

Filed Jan. 3, 1979, Ser. No. 742

Claims priority, application Italy, Jan. 4, 1978, 67002 A/78

Int. Cl.[2] B60T *13/16*

U.S. Cl. 303—52 **6 Claims**



1. Hydraulic servo-assisted braking system for motor vehicles, of the type comprising: a master cylinder; an auxiliary cylinder having an auxiliary piston mounted for fluid-tight sliding movement therein, and return spring means acting on the auxiliary piston, said auxiliary piston having a central through bore, brake actuator cylinders associated with the wheels on an axle of the vehicle and connected to said master cylinder through said auxiliary cylinder; a cylinder connected to the master cylinder in which a piston is sealingly slidable for displacement under the action of the pressure in said master cylinder chamber, and biassing spring means acting on said piston; a source of hydraulic fluid under pressure; a servo-cylinder containing a servo-piston having a stem which extends within the auxiliary cylinder so as to close, upon displacement of said servo-piston, the central bore of the said auxiliary piston, said servo-piston leaving said bore open when in its retracted rest position in the servo-cylinder;

wherein the improvements comprise the following elements in combination:

a master cylinder of the type controlling two separate braking circuits connected to the brake actuator cylinders of the respective pairs of wheels on two respective axles of the vehicle, through respective said auxiliary cylinders, wherein the respective auxiliary pistons are slidable sealingly against the action of respective return springs, the auxiliary pistons each having a central through bore;

a respective said servo-cylinder arranged coaxially with each respective auxiliary cylinder and having a respective said servo-piston fluid-tightly slidable within it against the action of a spring, the servo-piston having a stem extending within the associated auxiliary cylinder, said stem having an end which cooperates with the through bore in

the associated auxiliary piston to close said bore upon displacement of the said servo-piston against the action of said spring, said end of the stem being spaced from said auxiliary piston when the servo-piston is in a rest position;

an interception valve for connecting the ends of the servo-cylinders, on the opposite sides of the respective servo-pistons from the stems, to the source of hydraulic fluid under pressure, and resilient means for urging said interception valve in the direction of closure, and

a pair of pistons, each subjected to the pressure which acts during braking in one of the two braking circuits circuitis, connected to the master cylinder, said pistons acting on said interception valve to move the latter against the action of said resilient means.

4,203,632

ELECTRONIC CONTROL CIRCUIT FOR AN ELECTROMAGNETIC DECELERATOR

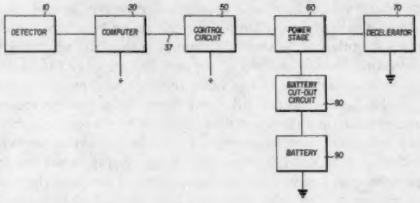
Michel Fabreges, Annonay, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 6, 1978, Ser. No. 913,102

Claims priority, application France, Jun. 9, 1977, 77 17635

Int. Cl.[2] B60T *8/02, 8/18*

U.S. Cl. 303—100 **4 Claims**



1. A circuit for the control of the amplitude of the electric current feeding a decelerator associated with a vehicle having a pressurized brake system with a brake pedal, comprising:

a power stage connected to said decelerator for driving said decelerator;

a control stage in series connection to said power stage for supplying command signals to said power stage and for triggering said power stage in accordance with a deceleration signal applied to said control stage;

a computer connected to said control stage for generating said deceleration signal based on the values of different vehicle parameters, said computer comprising,

first means for producing a first braking signal indicative of the manual application of braking to said vehicle, said first means including a command potentiometer activated by said brake pedal;

second means for producing second braking signals indicative of vehicle speed and for reducing said first braking signal when said vehicle speed is less than a predetermined value and increasing said first braking signal when said vehicle speed exceeds a predetermined value, said second means including a tachometric sensor; said tachometric sensor including an inductive proximity detector;

third means for producing a third braking signal indicative of brake system pressure and vehicle loading, said third braking signal combined with said first braking signal to limit the amplitude thereof; said third means including a brake pressure loading sensor and a vehicle loading sensor; and,

fourth means for producing a fourth braking signal indicative of the relative rotation speed between the front wheel and the rear wheel of the vehicle, said fourth braking signal combined with said first braking signal to reduce said first braking signal in accordance with the relative rotation speed between the front and rear wheels, said fourth means including a sensor for detecting rotation speed of the front wheels, and a sensor for detecting the rotation speed of the rear wheels;

said fourth means being comprised of a common clock and a pair of frequency threshold circuits for comparing the output of said inductive proximity detector with the output of said common clock, thereby producing said second braking signals;

wherein said deceleration signal is formed by the combination of said first, second, third and fourth signals and thereby is based on the values of the vehicle parameters respectively associated therewith.

4,203,633

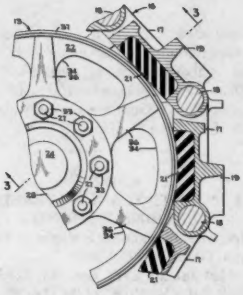
REDUCED NOISE PRODUCING IDLER WHEEL

Ronald B. Hare, Sunnyvale, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jul. 24, 1978, Ser. No. 927,070

Int. Cl.[2] B62D *55/12, 55/14*

U.S. Cl. 305—28 **6 Claims**



1. In combination with a track on a high speed tracked vehicle wherein the track has mounted on the inner surface thereof a plurality of elastomeric pads, and wherein the track is driven by a sprocket and is mounted in tension about a plurality of road wheels, and idler wheel arranged to receive said track the idler wheel being split into two spaced rim portions having annular peripheral surfaces thereon which come into contact with the elastomeric pads and accepting passage of track guides through the space therebetween, the improvement wherein the annular peripheral surfaces of the rim portions each include two spaced convex portions in transverse cross section, whereby the area of contact between said rim portions and the elastomeric pads is relatively small.

4,203,634

SEAL AND LOCKING ARRANGEMENT FOR A BEARING ASSEMBLY

Horst Back, Gochsheim, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 878,157

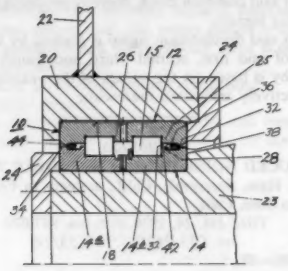
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 7704724[U]

Int. Cl.[2] F16C *33/78*

U.S. Cl. 308—187.2 **2 Claims**

1. A bearing assembly comprising inner and outer rings spaced apart to define an annular space for a plurality of rolling elements, at least one of the rings having a radially directed circumferentially extending first guide flange adjacent outer axial ends, each of said flanges having a circumferential surface confronting a circumferential surface of said other ring, means defining a circumferentially extending closed groove in the circumferential surface of said first flanges for an O-ring made of an elastic material, said other ring having a circumferentially extending second guide flange and means defining a recess in

the surface confronting the groove in said first guide flange, said recess being of a shallower radial depth than said groove and open in a direction toward the rolling elements, said O-ring engaging confronting surfaces of said groove and recess in the assembled position, said recess defined by a rib outboard of



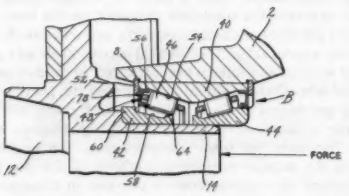
said recess spaced closely from said first guide flange, the outboard surface defining said rib being conical and outwardly divergent, the axial cross sectional area of said groove being at least as great as the cross sectional area of said O-ring in a compressed condition to facilitate assembly and disassembly of the rings with the O-ring in place.

4,203,635

WHEEL MOUNTING AND TAPERED ROLLER BEARING THEREFOR

Gerhard Reiter, Massillon, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Jul. 24, 1978, Ser. No. 927,516
Int. Cl.[2] F16C *33/58, 33/78*
U.S. Cl. 308—213 **17 Claims**



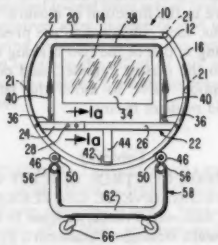
1. A roller bearing comprising an outer race having an inwardly presented tapered raceway, an inner race located within the outer race and having an outwardly presented tapered raceway located opposite the raceway for the outer race, the inner race further having a thrust rib at the large diameter end of its tapered raceway and a retaining rib at the small diameter end of its tapered raceway, the retaining rib having a beveled outwardly presented surface that leads away from the small end of the raceway for the inner race, increasing in diameter as it does; and rollers arranged in a row between the raceways of two races, with each roller having a large diameter end and a small diameter end, the large diameter ends of the rollers being adjacent to and normally abutting the thrust rib of the inner race and the small diameter ends being adjacent to the retaining rib of the inner race, the rollers and retaining rib being dimensioned and shaped such that as the inner race is withdrawn axially out of the outer race, the retaining rib will move the rollers axially a short distance until axial movement is blocked by means located adjacent to the large diameter end of the outer race, and whereupon the beveled surface on the retaining rib will deflect the small diameter ends of the rollers outwardly to an extent sufficient to free the inner race from the rollers and outer race.

4,203,636

ROCKABLE TV MOUNT

Theodore W. Wells, P.O. Box 8211, A/P Sta., San Francisco, Calif. 94128

Filed May 24, 1978, Ser. No. 909,315
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—7 TV **19 Claims**



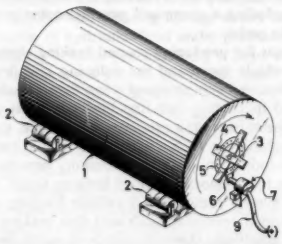
1. A mount for a television receiver having a viewing screen comprising: means adapted to be coupled to a television receiver for mounting the same for movement about a generally horizontal axis, said mounting means comprising base structure having means for positioning the television receiver thereon, means coupled with said positioning means for securing the television receiver thereto to prevent movement of the television receiver relative to said base structure, and means coupled with the base structure for supporting the same for rotation about a horizontal axis extending generally perpendicularly to the plane of the viewing screen of the television receiver when the latter is secured to the positioning means, whereby said base structure can be rotated about said axis to cause the viewing screen of the television receiver carried thereby to be tilted.

4,203,637

ELECTRICAL POWER TRANSMITTING APPARATUS

Michael Ahlgrim, Erftstadt; Gerhard Mietens, Hürth-Efferen; Wilfried Krieger, Brül, and Günter Sorbe, Hürth, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 1, 1978, Ser. No. 956,856
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749680
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—5 R **6 Claims**



1. A collector device for galvanic treatment from an electrical source of a rotatably mounted container having side faces, the collector device comprising a connecting piece, the connecting piece having upper and lower regions, fastening means connecting the upper region to one of the side faces of the container, a shaft rigidly connected to the lower region of the connecting piece, a cylindrical receiver, including a trough and a cover, insulating means connecting the cover to the

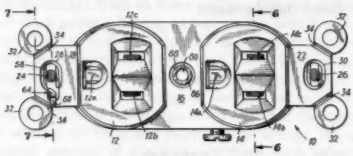
trough, the cover having a pair of bearing bushings mounted in axial alignment in opposite sides of the cover, the shaft being rotatably inserted into the bearing bushings, a low temperature melting alloy disposed in the trough, a contact plate electrically connected to the trough, a flexible electric cable electrically connected to another portion of the contact plate for connecting the device to the electrical source, a disk secured to the shaft within the receiver, the disk having a diameter which is constructed and arranged to immerse a substantial area of the disk into the low temperature melting alloy in the trough whereby the current from the electrical source is transmitted through the device when the alloy is molten.

4,203,638

ELECTRICAL RECEPTACLE AND GROUNDING STRIP THEREFOR

Hakki M. Tansi, Woodbury, N.Y., assignor to Eagle Electric Mfg. Co., Inc., Long Island City, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,172
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 P **32 Claims**



1. A one-piece multi-purpose grounding strip for electrical receptacles, comprising:

(a) a generally planar, elongated base portion mountable on an electrical receptacle;

(b) a female-type grounding socket portion of one-piece with said base portion and having a pair of spaced-apart fingers for receiving therebetween a male-type ground prong of an electrical plug, each finger being bendable between an initial and a bent position in which the respective finger is substantially coplanar and non-coplanar, respectively, relative to said base portion;

(c) a grounding lug portion of one-piece with said base portion and having a hole for receiving a ground terminal fastener, said lug portion being bendable between an initial and a bent position in which the lug portion is substantially coplanar and non-coplanar, respectively, relative to said base portion;

(d) an automatic grounding portion of one-piece with said base portion and having an aperture for receiving a mounting fastener for mounting the electrical receptacle to an electrical outlet box, said automatic grounding portion being bendable between an initial and a bent position in which the automatic grounding portion is substantially coplanar and non-coplanar, respectively, relative to said base portion;

(e) all of said portions being of one-piece non-riveted construction and being constituted by the same metal copper-based material of substantially uniform electrical conductivity; and

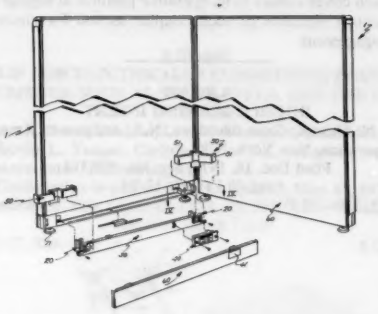
(f) all of said bendable portions being bent from their respective initial positions in which the grounding strip has a generally flattened configuration to, and being retained in, their respective bent positions in which the grounding strip has a three-dimensional configuration.

4,203,639

PANEL WIRING SYSTEM

Harold L. VandenHoek, Grand Rapids; Larry A. Speet, Holland, and Robert G. Mohr, Grand Rapids, all of Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.

Filed May 26, 1978, Ser. No. 909,975
Int. Cl.[2] H02G *3/06, 3/28*
U.S. Cl. 339—22 R **24 Claims**



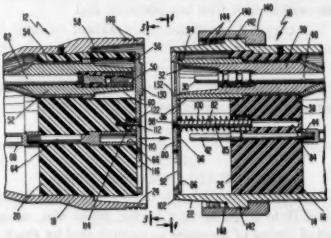
22. In a panel system comprised of at least two free standing movable room divider panels having enclosed electrical wiring, the improvement comprising: said wiring being located generally at the bottom of the panel, there being a space between adjacent panels at the bottom thereof when they are joined together; said panel system including a panel power connector for electrically joining adjacent panels, said connector being a generally elongated member for extending from one panel to the next adjacent joined panel and having a generally U-shaped deviation in the central area thereof, said generally U-shaped deviation projecting inwardly into said space between said adjacent joined panels, said generally U-shaped deviation being flexible whereby the angularly orientation of said joined panels relative to one another can be adjusted.

4,203,640

ELECTRICAL CABLE COUPLER WITH ROTATABLE PROTECTIVE COVERS

Charles D. Bice, Pittsburgh; John H. Cooper, Murrysville, and Michael L. Fenger, Westmoreland City, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 24, 1979, Ser. No. 6,138
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—41 **16 Claims**



1. An electrical cable coupler, comprising:

a first coupler section including one or more electrical contact elements;

a second coupler section including one or more electrical contact elements adapted for engagement with said contact elements of said first coupler section;

a protective cover rotatably mounted on each coupler section for movement between a protective position wherein the respective contact elements are covered to an operative position wherein said contact elements are exposed; and

means for nonrotatably coupling said covers together upon movement of said covers into face-to-face engagement whereby upon relative rotation of said coupler sections each cover rotates to its operative position to expose said contact elements of each coupler section for electrical engagement.

4,203,641

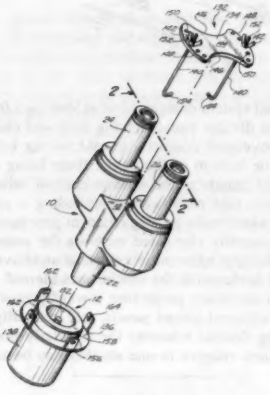
DOUBLE BUSHING INSERT

Larry N. Siebens, Great Meadows, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,314

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—75 P **15 Claims**



1. A double bushing insert adapted to be threadedly engageable with a bushing well receptacle wherein the double bushing insert comprises a first leg portion including means for threadedly engaging the complementary threaded stud of the bushing well receptacle, and second and third leg portions including female connector means for separable engagement with a corresponding male electrical connector means, wherein the improvement comprises:

means for rotatably supporting said threadedly engaging means within said first leg portion; and

means for causing simultaneous rotation of said first leg portion and said threadedly engaging means in a first direction and for permitting limited relative rotation between said first leg portion and said threadedly engaging means in a second direction.

4,203,642

ADJUSTABLE CONNECTOR

James V. Minard, Lake St. Louis County; Loeb J. Goldman, St. Louis, and Dale R. Foss, St. Charles, all of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 25, 1979, Ser. No. 42,471

Int. Cl.[2] H01R *13/62*

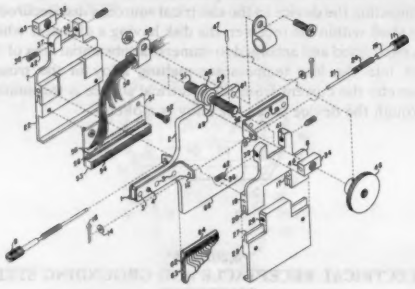
U.S. Cl. 339—75 MP **4 Claims**

1. An adjustable cardedge connector for use with two-sided pc boards, comprising:

a. a center structure, lying substantially coplanar with the pc board after mating;

b. two clamping arms, one each pivotally attached on either side of said center structure;

c. an actuation means for moving said arms, referenced to said center structure and extending laterally therefrom to attachments with each of said clamping arms;



d. a means for individually translating a segment of each clamping arm parallel to the clamping arm pivot axis; and

e. inwardly directed electrical contact means on the clamping arms for making contact between the connector and the pc board when said arms are actuated to compress the pc board therebetween.

4,203,643

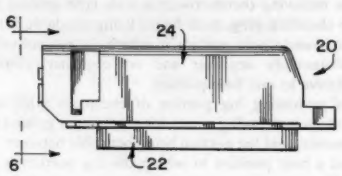
ELECTRICAL RIBBON CONNECTOR AND HOOD

Ronald F. Krolak, North Riverside, and Joseph Warywoda, Chicago, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jul. 24, 1978, Ser. No. 927,253

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—107 **15 Claims**



1. An electrical connector comprising:

an elongated insert member having first and second ends, a mating section to receive a complimentary electrical connector and a terminal section to receive electrical conductors for terminating to the connector;

a plurality of electrical contacts supported within said insert member and extending from said mating section to said terminal section;

a hood for enclosing said terminal section of said insert member; and

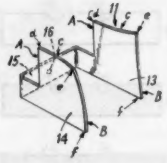
latch means associated with each end of said insert member and means for engaging said latch means associated with each end of said hood, said latch and latch engaging means having cooperating means for selectively assembling and disassembling said hood to and from a locked position on said insert member by either sliding said hood longitudinally along said insert member or pivoting said hood about one end of said insert member.

4,203,644

SPRING LOCK

Richard W. Wolpert, Roslyn Heights; Alan T. Wolpert, Massapequa; John F. Bender, Baldwin, and Harold McCormick, Roosevelt, all of N.Y., assignors to Union Connector Co., Inc., Roosevelt, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,889
Int. Cl.[2] H02B *1/04*
U.S. Cl. 339—128 **5 Claims**



1. A device, for the releasable locking of an item in a panel aperture bounded by two spaced opposed edges, comprising:

(i) a bridge portion for securing to the item, and

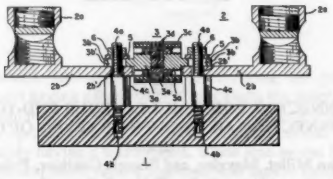
(ii) first and second wing portions carried at spaced opposed positions on said bridge portion, at least part of the device being resiliently deformable to permit approaching and separating movement of the wings, each wing portion having a first edge which extends in the direction away from the bridge from an inner end to a first tip of the wing, each wing portion having an outer edge which terminates at one end at said first tip and at the other end at said second tip, the spacing from each other of the inner ends being less than the spacing of the opposed edges of the panel aperture, the spacing of the first tip of each wing from the plane of the bridge being less than the spacing of the second tip from the plane of the bridge, the unconstrained spacing of the first tips from each other being greater than the spacing of the opposed edges of the panel aperture.

4,203,645

DEVICE FOR INSERTING A FUSE INTO AN ELECTRIC CIRCUIT

George D. Shennett, Jr., Amesbury, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 5, 1978, Ser. No. 966,639
Int. Cl.[2] H01R *9/18*
U.S. Cl. 339—147 R **1 Claim**



1. A device for inserting an electric fuse into an electric circuit comprising:

(a) a base of electric insulating material;

(b) a pair of aligned cable connectors supported in spaced relation by said base, said pair of cable connectors having axially outer cable receiving ends and axially inner perforated blade contact supporting ends;

(c) an electric fuse having a pair of perforated blade contacts supported by said blade contact supporting ends of said cable connectors; and

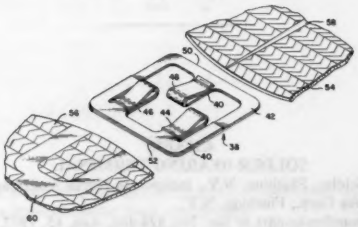
(d) joint means for supporting said pair of cable connectors on said base and for supporting said pair of blade contacts on said blade contact supporting ends of said cable connectors, said joint means comprising a pair of shafts having upper machine-screw-threaded ends projecting through said pair of perforated blade contacts and through said perforated blade contact supporting ends of said cable connectors, intermediate portions of larger width than the outer diameter of said machine-screw-threaded ends for spacing said blade contact supporting ends of said cable connectors from said base, and said shafts having self-tapping lower ends projecting into said base.

4,203,646

CLIP FOR ELECTRICALLY CONNECTING PLANAR ELEMENTS, SUCH AS SOLAR CELLS, AND THE LIKE, IN SERIES

Jerome A. Desso, Steelton; Leon T. Ritchie, Mechanicsburg, and Marvin L. Yeager, Carlisle, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 906,543, May 17, 1978, abandoned. This application Feb. 15, 1979, Ser. No. 12,264
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—205 **6 Claims**



1. A clip for electrically interconnecting adjacent pairs of planar members, such as solar cells and the like, in series, said clip comprising:

a metal blank having at least one web of insulative material bonded to one side of said blank covering approximately half the surface area thereof,

at least one first arm and at least one second arm formed in said blank, each arm extending in cantilever fashion above a portion of said blank toward an end thereof,

said first and said second arms being oppositely directed with said first arm presenting an uninsulated surface to an insulated portion of said blank and said second arm presenting an insulated surface to an uninsulated portion of said blank whereby first and second members received in opposite ends of said clip have a first side of a first member electrically connected to a second side of a second member.

4,203,647

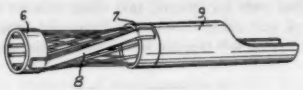
ELECTRIC SOCKETS FOR PLUG AND SOCKET CONNECTORS AND METHODS FOR THEIR MANUFACTURE

Francois R. Bonhomme, 6 Parc de Bearn, Saint-Cloud, France (92210)

Filed Jan. 19, 1979, Ser. No. 4,864
Claims priority, application France, Jan. 25, 1978, 78 01990
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—256 R **3 Claims**

1. An electric socket for plug and socket connectors, comprising a plurality of resilient conducting wires each of which is stretched between first and second points located respectively on first and second circles, which circles are located respectively on two relatively rigid rings rigidly fixed with respect to each other, so that a radius of the first circle passing through said first point on each wire and a radius of the second

circle passing through said second point on the same wire make between themselves an angle of a fixed value different from zero, whereby straight lines along which the respective wires extend at rest may be obtained from one another by rotation about an axis common to the first and second circles,



wherein said two rings are rigidly fixed with respect to each other through at least two metallic, relatively rigid distance-pieces circumferentially spaced from each other, which distance-pieces are each fixed symmetrically to said rings while being inclined substantially in the same direction and by about the same angle as the adjacent resilient wires, with respect to said axis.

4,203,648

SOLDER BEARING TERMINAL

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corp., Flushing, N.Y.

Continuation-in-part of Ser. No. 824,441, Aug. 15, 1977, Pat. No. 4,120,558. This application Aug. 23, 1978, Ser. No. 935,151
Int. Cl.² H01R *11/06*
U.S. Cl. 339—275 T **9 Claims**

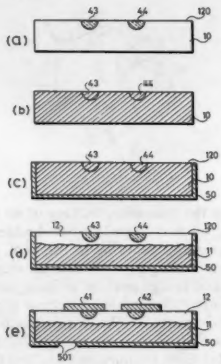
1. A terminal clip for securement to a contact pad on a substrate comprising an elongated clip body portion having a free end and a stem end, said body portion being cut longitudinally along two lines to define a central finger between spaced portions of the body portion, said finger being bent out of the plane of the body portion at approximately the point of attachment of said finger to the body portion, the free end of said body portion beyond said point of attachment constituting at least one additional finger and being bent out of the plane of the body portion in the same direction as the central finger, said central finger and additional finger defining a gap to receive the substrate, and a discrete mass of solder, the central finger being wrapped at least 180° around said mass of solder and indented into the surface of said mass for holding said mass of solder in a position adjacent said gap and on the side thereof nearer the stem end of the body portion.

4,203,649

PROCESS FOR MANUFACTURING AN INTEGRATED OPTICAL STRUCTURE AND AN OPTO-ELECTRONIC DEVICE USING SAID STRUCTURE

Gonzalo Velasco, and Michel Papuchon, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 2, 1978, Ser. No. 930,410
Claims priority, application France, Aug. 5, 1977, 77 24219
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.14 **6 Claims**



1. Process for manufacturing an integrated optical structure whereof the operation requires the application of an electric field, comprising the following steps:

(a) formation of at least one light-guide by localized doping of a region of the substrate constituted by a basic material saturated with oxygen;

(b) reduction of the material of said substrate by thermal treatment in a hydrogen plasma;

(c) deposition of a protective layer impermeable to oxygen over all the faces minus one of said substrate;

(d) oxidization of said substrate by the penetration of oxygen through the unprotected face of said substrate;

(e) deposition of electrodes on said unprotected face, the rest of the material not oxidized in the preceding step being intended to serve as the earth electrode of the structure.

4,203,650

CONNECTOR FOR SIMULTANEOUS END-TO-END CONNECTION OF GROUPS OF SEVEN OPTICAL FIBRES

Christian Millet, Meyzieu, and Francis Gauthier, Pelussin, both of France, assignors to Les Cables de Lyon, Lyons, France

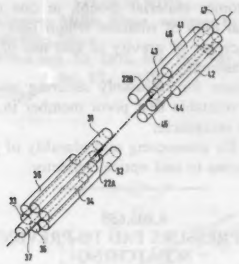
Filed May 31, 1978, Ser. No. 911,242
Claims priority, application France, May 31, 1977, 77 16566
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.21 **8 Claims**

1. A connector for simultaneous end-to-end connection of two groups of seven optical fibres, each fibre having a protective covering, said connector comprising:

opposite end pieces having oppositely directed tapering funnels leading to orifices of a size corresponding to the diameter of the circle circumscribing the assembly of the seven fibres in a centered, hexagonal configuration, and

means for alternate reciprocal longitudinal adjustment of the positions of the end faces of the peripheral fibres into two

different planes relative to a mean connection plane intermediate of said end pieces,



a first plane ahead of the mean connection plane and a second plane behind the mean connection plane and symmetrically of the first plane.

4,203,651

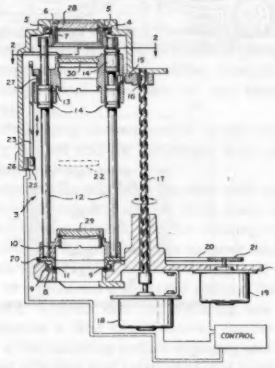
OPTICAL APPARATUS FOR VARYING FOCAL POWER ALONG ONE PRINCIPAL MERIDIAN WHILE MAINTAINING CONSTANT FOCAL POWER ALONG THE OTHER PRINCIPAL MERIDIAN

Staffan B. Persson, Kenmore, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 2, 1976, Ser. No. 710,772

Int. Cl.[2] G02B *15/00, 13/08*

U.S. Cl. 350—181 **4 Claims**



1. Apparatus for varying focal power along one principal meridian and having a fixed focal power along the other principal meridian in an optical system which comprises a stationary frame, an optical assembly rotatably mounted on said frame, said assembly having a track means, a first lens mount fixed at one end of said track means, a second lens mount fixed at the distal end of said track means, each of said first and second lens mounts having one of first and second cylinder lenses supported therein, each of said first and second cylinder lenses having an axis of cylinder positioned in a first plane containing said other principal meridian, a carriage slidably mounted on said track, a third cylinder lens supported by said carriage, said third cylinder lens having an axis of cylinder normal to said first plane and in a second plane with said one principal meridian, said first and second cylinder lenses having a combined cylinder power, said third cylinder lens having a cylinder power substantially equal to said combined cylinder power, a rotatable threaded member mounted on said frame and extending parallel to said track, a follower connected to said carriage and operably engaging said member to position said carriage at a selected location, a motor including control means operably connected to said member and a motor and control means for selectively rotating said optical assembly, whereby the cylindrical focal power along said one principal meridian in said optical system can be varied by sliding said carriage along said track and said one principal meridian can be oriented by rotating said assembly.

4,203,652

BEAM SHAPING OPTICAL SYSTEM

Hiroshi Hanada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

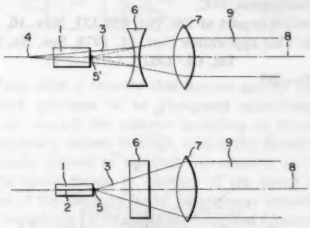
Continuation of Ser. No. 769,728, Feb. 17, 1977, abandoned.

This application Jun. 6, 1978, Ser. No. 913,225

Claims priority, application Japan, Feb. 15, 1977, 52-15341; Feb. 15, 1977, 52-15342; Feb. 15, 1977, 52-15343; Feb. 15, 1977, 52-15344

Int. Cl.[2] G02B *13/08, 13/10*

U.S. Cl. 350—182 **23 Claims**



1. A beam shaping optical system for collimating the beam from a semiconductor laser, comprising:

a semiconductor laser element, the origin of divergence of the beam from the exit surface of said element in a direction parallel to the joining surface of said element lying at a position on a certain axis remote from said exit surface, the origin of divergence of said beam in a direction perpendicular to said joining surface lying at a position on said certain axis adjacent said exit surface; and

an optical system having different focal lengths in directions orthogonal to each other, the optic axis of said optical system being coincident with said certain axis, said focal lengths being coincident with said origins of divergence, respectively.

4,203,653

INVERTED TELEPHOTO TYPE WIDE ANGLE LENS SYSTEM

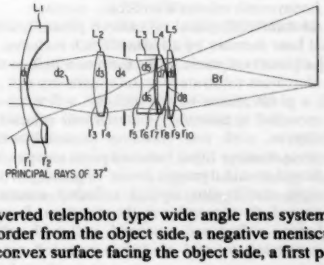
Ikuo Mori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 23, 1978, Ser. No. 918,592

Claims priority, application Japan, Jun. 29, 1977, 52-77329

Int. Cl.[2] G02B *9/60*

U.S. Cl. 350—216 **5 Claims**



1. An inverted telephoto type wide angle lens system comprising, in order from the object side, a negative meniscus lens having its convex surface facing the object side, a first positive

lens, a negative lens, a second positive lens and a third positive lens, said lens system satisfying the following conditions:

$$0.25f<d_4<0.5f$$

$$1.6d_4<d_2<2.5d_4$$

$$d_3<0.5d_4,$$

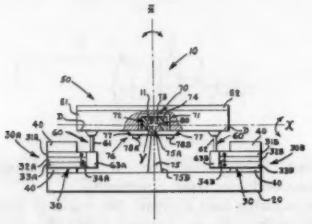
where d_2 is the air space between the negative meniscus lens and the first positive lens, d_3 is the center thickness of the first positive lens, d_4 is the air space between the first positive lens and the negative lens, and f is the total focal length of the entire system.

4,203,654

LINE-OF-SIGHT STABILIZATION REFLECTOR ASSEMBLY

Herbert B. Ellis, La Canada, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 850,327, Nov. 10, 1977, abandoned. This application Nov. 21, 1978, Ser. No. 962,741
Int. Cl.² G02B *7/18*
U.S. Cl. 350—285 **4 Claims**



1. A line-of-signt stabilization optical assembly having a dynamic center of gravity through which pass three orthogonal axes of rotation, wherein said three axes are a first axis, a second axis, and a third axis, comprising:

a. a base member;

b. a plurality of piezoelectric bender elements adjacent to, and in abutting contact with, said base member, wherein each piezoelectric bender element includes two piezoelectric ceramic wafer members that are in electrical connection with each other, and a central metallic wafer member that is interposed between said two piezoelectric ceramic wafer members;

c. means for clamping said piezoelectric bender elements to said base member;

d. an optical reflector pivotally connected to said base member, wherein said optical reflector is a mirror which comprises:

(1) a welded aluminum honeycomb substrate structure member;

(2) and, a plane replicated front surface optical mirror surface member integrated with said welded aluminum honeycomb substrate structure member;

and wherein said optical reflector is pivotally connected to said base member by a means which includes:

(1) a pivot receptacle in the form of a hole in said welded aluminum substrate structure member;

(2) a pivot means which includes a first pivot member mounted in elastomer material and rotatably movable therein, with said elastomer-mounted rotatable first pivot member fitted into said pivot receptacle and positioned at said dynamic center of gravity of said line-of-sight stabilization optical reflector assembly, and a second pivot member in the structural form of a shaft having a first and a second end, with said first end connected to said elastomer-mounted rotatable first pivot member, and with said second end connected to said base member, and wherein said elastomer-mounted rotatable first pivot member is rotatable, in and within said elastomer material mount, in one of said three orthogonal axes of rotation which pass through said dynamic center of gravity of said line-of-sight optical reflector assembly;

(3) and, means for releasably securing said elastomer-mounted rotatable first pivot member in, and within, said pivot receptacle;

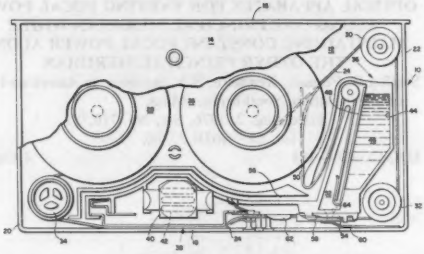
e. and, means for connecting said plurality of piezoelectric bender elements to said optical reflector.

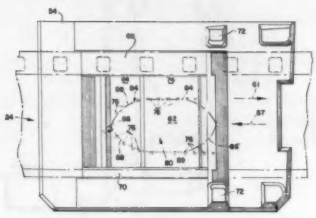
4,203,655

TAPERED PRESSURE PAD TO PREVENT FILM SCRATCHING

Joseph A. Stella, Peabody, and Paul B. Mason, Magnolia, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1979, Ser. No. 248
Int. Cl.² G03B *23/02*
U.S. Cl. 352—78 R **6 Claims**





1. In a film cassette having a processing fluid applicator and a pressure pad assembly, said assembly having a resiliently biased pressure pad with a film engaging surface constructed to slidably, supportingly engage successive incremental portions of a non-emulsion surface of a strip of photographic film in a predetermined plane as the film is advanced in one of two opposite directions of film travel across a nozzle opening of the processing fluid applicator while the processing fluid is deposited through the nozzle opening onto the film's emulsion surface, the improvement comprising:

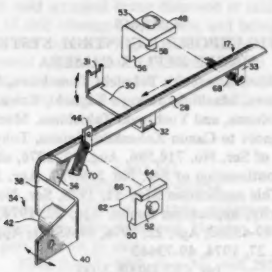
said pressure pad having at least one particle engaging surface depending from said film engaging surface and facing in a direction at least opposite to said one direction, said particle engaging surface being constructed to divert film carried particles impinging thereagainst in a manner and direction such that the particles are prevented from being retained by said pressure pad so as to substantially eliminate the possibility of the non-emulsion surface being scratched by such particles during film advancement in said one direction.

4,203,656

FEED SHUTTLE MECHANISM FOR MOTION PICTURE FILM STRIPS

David C. McElwaine, Millis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 13, 1978, Ser. No. 941,762
Int. Cl.[2] G03B 1/22
U.S. Cl. 352—194 2 Claims



1. A mechanism for incrementally advancing a film strip having uniformly spaced apertures along the length thereof, said mechanism comprising:

a shuttle;

means for supporting said shuttle with respect to a longitudinal axis extending parallel to the direction of film advancement, said supporting means permitting rotational movement and longitudinal movement of said shuttle with respect to said axis;

a film aperture engaging claw supported by said body member laterally of said axis for movement with said body member relative to said axis;

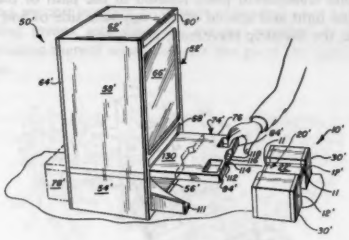
means for reciprocating said body member with respect to said axis through repeated cycles, each cycle including advance and retract strokes, and for rotating said body member about said longitudinal axis to move said claw to a film aperture engaging position during said advance stroke and to a retracted disengaged position during said retract stroke, wherein said reciprocating and rotating means comprises a first cam follower carried by said shuttle and a first camming surface engaging said first cam follower and effecting said rotation of said body member about said longitudinal axis, and a second cam follower extending substantially parallel to said longitudinal axis and carried by said shuttle at a location laterally displaced from said axis and further located in one of the two radial quadrants with respect to said axis on the opposite side of said axis from said film engaging claw, and a second camming surface, engaging said second cam follower, and effecting said reciprocation of said body member upon rotation of said second camming surface about a rotational axis, the movement of said second camming surface in contact with said second cam follower during rotation thereof being in a direction opposite to the movement of said film engaging claw when said claw is moving into engagement with said film strip apertures, whereby the frictional forces developed as a result of the engagement of said second cam follower and said second camming surface is reacted through said shuttle to encourage rotation of said shuttle and said claw carried thereby about said axis to ensure positive engagement of said claw with said film strip perforations.

4,203,657

MICRO IMAGE CASSETTE AND VIEWER

Arnis E. Peters, La Crosse, Wis., assignor to Northern Engraving Company, Sparta, Wis.

Continuation-in-part of Ser. No. 861,523, Dec. 19, 1977. This application Apr. 14, 1978, Ser. No. 896,463
Int. Cl.[2] G03B 23/12, 1/48
U.S. Cl. 353—26 R 14 Claims



1. For use with a cassette that houses spaced spool means upon which portions of an elongated microimage-bearing filmstrip are wound, the cassette including an elongated filmstrip passageway means through which the filmstrip may be longitudinally moved in selected incremental amounts from one of the spool means to another of the spool means, the movement of the filmstrip in the passageway means defining a filmstrip traversing plane, and the elongated filmstrip passageway means including a transverse aperture for permitting a projected light to pass through a selected portion of the filmstrip for greatly enlarged and focused display of the microimage that is provided on the selected portion of the filmstrip, the improvement comprising, in combination:

a first transparent plate located in the path of the projected light and spaced to one side of and away from the filmstrip traversing plane;

a second transparent plate located in the path of the projected light and spaced on the opposite side of and away from the filmstrip traversing plane;

the first and second transparent plates having a normal condition, when the filmstrip is not being moved, which permits opposite sides of the selected portion of the filmstrip to be moved out of said filmstrip traversing plane and to be engaged by both transparent plates so as to position said selected portion of the filmstrip in a desired focal plane that is spaced from said filmstrip traversing plane;

first and second means for respectively causing the filmstrip to move longitudinally at relatively high speed and relatively low speed; and

means operative to move one of the plates away from said normal, filmstrip-engaging, condition when the filmstrip is moved at its relatively high speed to permit the filmstrip to then move into the filmstrip traversing plane spaced from both transparent plates.

4,203,658

MICRO IMAGE STORAGE AND RETRIEVAL APPARATUS

Arnis E. Peters, LaCrosse, Wis., assignor to Northern Engraving Company, Sparta, Wis.

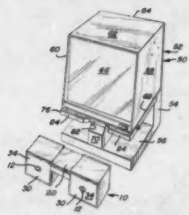
Filed Dec. 19, 1977, Ser. No. 861,523
Int. Cl.[2] G03B 1/48, 23/12; G02B 7/02
U.S. Cl. 353—26 R 25 Claims

1. For use with a cassette that houses spaced spool means upon which portions of an elongated microimage bearing filmstrip are wound, the cassette including an elongated filmstrip passageway means through which the filmstrip may be longitudinally moved in selected incremental amounts from one of the spool means to another of the spool means, the movement of the filmstrip in the passageway means defining a

filmstrip traversing plane, and the elongated film passageway means including a transverse aperture for permitting a projecting light to pass through a selected portion of the filmstrip for greatly enlarged and focused display of the microimage that is provided on the selected portion of the filmstrip, the improvement comprising in combination:

a first transparent plate located in the path of the projected light and spaced to one side of and away from the filmstrip traversing plane;

a second transparent plate located in the path of the projected light and spaced on the opposite side of and away from the filmstrip traversing plane; and



separation-clamping means operable prior to moving the filmstrip through the filmstrip passageway means for effecting separation of the first and second plates, so that the filmstrip is completely free of engagement with both of said transparent plates during movement of said filmstrip in the filmstrip traversing plane, the separation-clamping means being also operable after a selected portion of the filmstrip has been moved into and stopped in the path of the projected light for moving one of the transparent plates to a position for clamping the selected filmstrip portion between said first and second plates in a preselected filmstrip focusing plane that is spaced from the filmstrip traversing plane.

4,203,659

TRANSPARENCY STORAGE AND DISPLAY APPARATUS

Paul Constantine, New York; Melvyn Ettinger, East Meadow, both of N.Y., and Harry S. Rubin, Willow Grove, Pa., assignors to Instructo/McGraw-Hill, Inc., Paoli, Pa.

Filed Jun. 12, 1978, Ser. No. 914,971

Int. Cl.[2] G03B *21/00*

U.S. Cl. 353—120 **12 Claims**

1. Apparatus adapted to be supported on a projection area of a viewing device for retaining transparencies, each having a predefined mounting edge, for storage and display comprising:

a mounting member for holding the transparencies substantially along their mounting edges in general alignment;

an opposing member in spaced relation to said mounting member;

a first connecting member having first and second ends connected to corresponding ends of the mounting and opposing members; and

a second connecting member having first and second ends connected to the other corresponding ends of the mounting and opposing members;

said members cooperating to form a frame dimensioned to circumscribe the periphery of said transparencies and having inner and outer walls, at least one top wall and at least one bottom wall for resting on the projection area of the viewing device, said mounting member holding the mounting edge of each transparency in a substantially constant position with respect to said bottom wall, said frame having means for concentrating its weight substantially in said mounting and opposing members;

said mounting member has a lower surface which is elevated with respect to the bottom wall of the frame, said lower surface cooperating with said connecting members to define a channel of sufficient height and width to receive in stacked arrangement all transparencies held by said mounting member.

4,203,660

AUTOMATIC EXPOSURE CONTROL SYSTEM FOR SINGLE REFLEX CAMERA

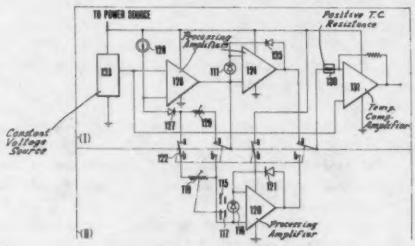
Masanori Uchidoi, Kawasaki; Tokuichi Tsunekawa, Yokohama; Hiroshi Aizawa, Machida; Tetsuya Taguchi, Kawasaki; Tadashi Ito, Yokohama, and Yoshiyuki Takishima, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 718,586, Aug. 30, 1976, abandoned, which is a continuation of Ser. No. 569,757, Apr. 21, 1975, abandoned. This application May 11, 1978, Ser. No. 904,819

Claims priority, application Japan, Apr. 22, 1974, 49-45279; Apr. 22, 1974, 49-45280; Apr. 22, 1974, 49-45281; Apr. 22, 1974, 49-45282; Jun. 27, 1974, 49-73643

Int. Cl.[2] G03B *7/00*

U.S. Cl. 354—31 **4 Claims**



1. A camera which permits change-over between different light measuring systems, said camera comprising:

a camera body provided with:

(a) a first light receiving element which measures light coming from an object to be photographed;

(b) a first light measurement operational amplifier which has said first light receiving element connected between the input terminals thereof, said first light measurement operational amplifier being arranged to produce an electrical signal corresponding to the output of said first light receiving element;

(c) a light measurement information producing circuit which produces a light measurement information signal for exposure computation; and

(d) change-over means connected between said light measurement information producing circuit and said first light measurement operational amplifier, said change-over means being arranged to be shiftable between a first position thereof in which said change-over means connects said first light measurement operational amplifier to said light measurement information producing circuit and a second position in which said change-over means does not connect said first light measurement operational amplifier to said light measurement information producing circuit, said electrical signal from said first light measurement operational amplifier being applied to said light measurement information producing circuit when said change-over means is shifted to said first position thereof; and

an accessory device which is attachable to said camera body, said accessory device being provided with:

(a) a second light receiving element which measures light from the object within a light measurement range different from that of said first light receiving element;

(b) a second light measurement operational amplifier which has said second light receiving element connected between the input terminals thereof, said second light measurement operational amplifier being arranged to produce an electrical signal corresponding to the output of said second light receiving element; and

(c) a terminal to which said electrical signal from said second light measurement operational amplifier is applied, said terminal being disposed at said second position of said change-over means and being arranged to have said electrical signal from said second light measurement operational amplifier applied to said light measurement information producing circuit when said changeover means is shifted to said second position thereof.

4,203,661

OPTICAL SYSTEM

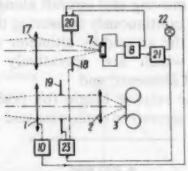
Walter Besenmatter, Vienna, Austria, assignor to Ing. Karl Vockenhuber and DDr. Raimund Hauser, both of Vienna, Austria, part interest to each

Filed Sep. 7, 1978, Ser. No. 940,293

Claims priority, application Austria, Sep. 16, 1977, 6661/77

Int. Cl.[2] G03B *7/08, 13/02, 9/02*

U.S. Cl. 354—53 **19 Claims**



1. An optical system comprising a lens with adjustable focal length and an aperture plate having a variable opening so as to maintain constant the amount of light leaving the lens and a light-meter device which is attached to an aperture plate adjustment device, characterized by the fact that the aperture plate adjustment device (**9, 14, 23**) is attached to a focal-length adjustment device (**10;57;80;101;115**) so that its aperture can be limited by this focal-length adjustment device, and by the fact that a signalling device (**11,16,21,28, 43,53,106**) is provided which emits a signal if the opening of the aperture plate defined by the focal-length adjustment device is smaller than the opening of the aperture plate (**4;13;19;102;112**) controlled by the light-meter device.

4,203,662

TRIGGER MECHANISM FOR PHOTOGRAPHIC CAMERA PROVIDED WITH MOTOR-DRIVEN FILM-TRANSPORT MECHANISM

Otto Stemme, Munich; Peter Lermann, Feldkirchen; Rolf Schröoder, Baldham, and Horst Karl, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 939,374, Sep. 5, 1978. This application Mar. 2, 1979, Ser. No. 16,894

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1978, 2841604

Int. Cl.[2] G03B *1/18, 17/38*

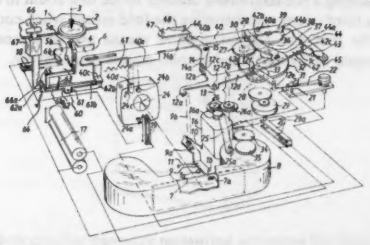
U.S. Cl. 354—173 **14 Claims**

1. In a photographic still camera, in combination, an electric motor, a control member mounted for movement in a first direction from a first to a second position and in an opposite second direction back to the first position, drive spring means operative when the control member is not blocked for driving the control member in the first direction, motion-transmitting means responding to the control member reaching its second position by coupling the control member to the motor to cause the control member to be returned by the motor back to the first position, and an improved user-activated trigger mechanism serving to block and unblock first-direction movement of the control member,

the improved user-activated trigger mechanism comprising:

a release member which the user moves from a first position to a second position to initiate exposures,

biasing means returning the release member to the first position thereof when the user lets go of the release member,



first mechanical blocking means assuming a blocking setting when the release member is in its first position for blocking first-direction movement of the control member and when the release member is in its second position assuming an unblocking setting not blocking first-direction movement of the control member;

second mechanical blocking means operative upon completion of the second-direction movement of the control member for assuming a blocking setting blocking first-direction movement of the control member at least until such time as the first blocking means reassumes its blocking setting.

4,203,663

COMPUTER CONTROLLED ELECTROSTATIC COPYING MACHINE

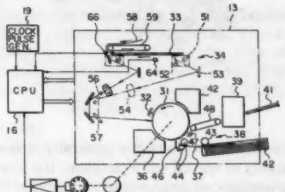
Masaaki Ogura; Nachio Seko, and Takato Yano, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 10, 1978, Ser. No. 950,159

Claims priority, application Japan, Nov. 28, 1977, 52-141488

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 C **11 Claims**



1. An electrostatic copying machine including a rotary photoconductive member, imaging means for scanning an original document and radiating a light image thereof onto the photoconductive member to form an electrostatic image thereon and feed means for feeding a copy medium into image transferring engagement with the photoconductive member, characterized by comprising:

first pulse generator means driven synchronizingly by rota-

tion of the photoconductive member for generating first pulses;

second pulse generator means for generating second pulses having a frequency higher than the first pulses;

first counter means for counting the first pulses;

second counter means for counting the second pulses, the second counter means being reset by each of the first pulses;

sensing means for sensing movement between the imaging means and the document to a predetermined relative position and producing a signal in response thereto; and

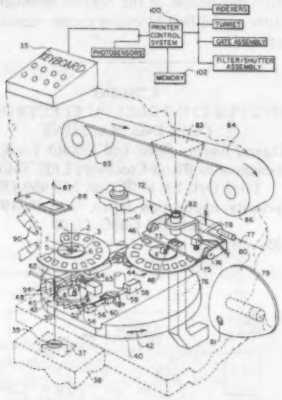
computing means for storing first and second counts of the first and second counter means in response to the signal, adding a predetermined number to the first count to obtain a third count and actuating the feed means when counts in the first and second counter means are simultaneously equal to the third and second counts respectively.

4,203,664

FILM POSITIONING APPARATUS

Jerry L. Clifton; Ralph Gentile, both of Rochester; Russell G. Hurlbut, Hilton, and James L. King, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,350
Int. Cl.[2] G03B *27/32, 27/76, 27/62*
U.S. Cl. 355—64 **9 Claims**



1. Apparatus for positioning a generally disk-shaped film unit in a plurality of spaced work positions, the film unit having a hub and a plurality of images disposed around the hub, said apparatus comprising:

means for supporting the film unit;

means for positioning said supporting means to locate the supported film unit at each of the positions;

means for illuminating an image of the film unit at one of the positions; and

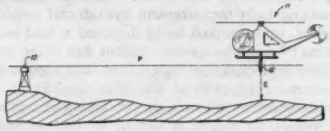
means engageable with the hub for moving the film unit relative to said supporting means in said one position to position selected images of the film unit relative to said illuminating means.

4,203,665

AERIAL SURVEYING METHOD TO DETERMINE GROUND CONTOURS

Richard A. Boulais, Phoenix, Ariz., assignor to Laser Systems, Inc., Phoenix, Ariz.

Filed Jan. 15, 1979, Ser. No. 3,704
Int. Cl.[2] G01C *3/08;* G01B *11/26*
U.S. Cl. 356—4 **1 Claim**



1. A method for aerial surveying to determine ground contours, said method comprising, in combination, the steps of:

(a) locating a rotating-beam laser generator at a known point on the ground and rotating said laser beam to define a reference plane;

(b) measuring the relative height of an aircraft with respect to said reference plane by sensing the location of said rotating laser beam with a stacked-array optical sensor carried by said aircraft and responsive to said beam;

(c) establishing a survey track for said aircraft along the ground and measuring the position of said aircraft along said track;

(d) continuously moving said aircraft along said track while simultaneously continuously measuring the altitude of said aircraft above the ground by altimeter means carried by said aircraft which are operatively independent of ground-located elements; and

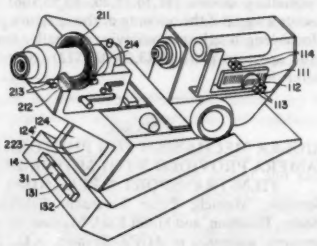
(e) correlating the relative height (b), position (c) and altitude (d) of said aircraft to determine said ground contours.

4,203,666

LENSMETER

Tadao Ii, Yokohama; Takashi Tanaka, Tokyo, and Hayao Akaba, Akishima, all of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,505
Claims priority, application Japan, Nov. 30, 1976, 51/144533
Int. Cl.[2] G01B *9/00*
U.S. Cl. 356—124 **18 Claims**



1. A lensmeter comprising, a target, an optical system for converting a power of a test lens to the relative movement of the target with respect to the test lens and a diopter displaying system for digitally displaying the dioptral number of digits with plus or minus sign of the power from the relative target movement, the diopter displaying system comprising:

a linear encoder for producing two sets of pulse signals with a phase difference, wherein the number of pulses in each set is equal and corresponds to the relative distance moved by the target and the phase difference corresponds to the direction of motion of the target, and the number of pulses

of the two sets of pulse signals which corresponds to the distance of movement for one diopter is n, n being a predetermined integer in the range from four to thirty-two,

first circuitry connected with the linear encoder for converting the two sets of pulse signals with the phase difference to a dioptral number with plus or minus sign including means for dividing the number of pulses of the two sets of pulse signals by said predetermined integer n to obtain the integer part of the number and a remainder and means for multiplying the remainder by 1/n to obtain the fractional part of the number,

second circuitry substantially the same as the first circuitry,

means for resetting the second circuitry, and

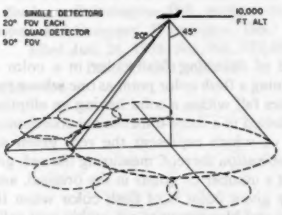
means for alternatively connecting or dissociating the second circuitry with the linear encoder.

4,203,667

COVERT RECOVERY OR SIGNALLING SYSTEM

Russell W. Pierce, Bremerton, Wash.; Edward A. Teppo, and Henry P. Leet, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1978, Ser. No. 965,760
Int. Cl.[2] G01B *11/26*; H04B *9/00*
U.S. Cl. 356—152 **3 Claims**



1. A location signalling apparatus comprising:

a source of electromagnetic radiation emitted along an optical axis;

a means for modulating said source of electromagnetic radiation so that said radiation is emitted with a predetermined pattern;

a means for detecting said emitted radiation whenever said detector means lies along said optical axis comprising:

a central lens system with a plurality of lenses, each lens focusing light from a predetermined area along an optical axis for the lens receiving said emitted radiation, said lenses arranged to have one lens define a large central area that is observed and the remaining lenses define a plurality of smaller overlapping areas covering at least half the perimeter of said central area in a predetermined fashion;

a quadrant detector situated on the lens axis of the lens defining said central area for detecting said emitted radiation when said source is within a quadrant of said central area;

a plurality of detectors placed with at least one detector for receiving said emitted radiation from each of said lenses observing said smaller predetermined area if said source of emitted radiation is in one of them; and

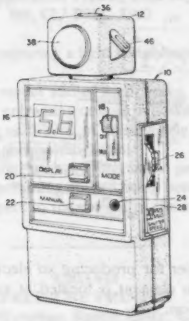
a position indicator means connected to said detector means for identifying which of said detectors is observing said source, if any, and if said source is being observed by said quadrant detector, where within said central area said source is located.

4,203,668

DIGITAL EXPOSURE METER

Darwin E. Chapman, Palo Alto, Calif., assignor to Creative Phototronics, Inc., Mountain View, Calif.

Filed Mar. 31, 1978, Ser. No. 892,415
Int. Cl.[2] G01J *1/42*
U.S. Cl. 356—215 **19 Claims**



1. Photographic exposure measuring apparatus for determining the intensity of illumination due to high intensity transient illumination and steady state sources of illumination over a preset period of time corresponding to a camera shutter speed, the apparatus comprising photo-optic sensor means for detecting the intensity of illumination and for producing an electrical signal whose magnitude is proportional thereto, means for integrating the sensor signal with respect to time over the preset time period to determine the amount of illumination, control means supplied with the integrated sensor signal information for thereupon producing an output display signal corresponding to the appropriate camera aperture setting for a given film's light sensitivity (film speed), output display means supplied with the display signal for displaying the appropriate camera aperture setting in graphical symbols at least one-half inch wide and one-half inch high, and trigger means supplied with the sensor signal and responsive to a sudden change in it corresponding to a high intensity flash of illumination, for thereafter blocking further sensor signals produced by subsequent flashes until the integration is completed and the corresponding aperture setting is displayed by the output display means.

4,203,669

WAVELENGTH READING APPARATUS FOR MONOCHROMATOR

Yoshio Maeda; Koichi Matsumoto, and Koji Nishiwaki, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 734,306, Oct. 20, 1976, abandoned. This application May 8, 1979, Ser. No. 37,033
Claims priority, application Japan, Oct. 23, 1975, 50-126906
Int. Cl.[2] G01J *3/12*
U.S. Cl. 356—332 **11 Claims**

1. A wavelength reading apparatus for an optical instrument comprising:

an optical system having a dispersion element rotatably mounted with its tuning wavelength varying in accordance with the variation of its angular position in rotation;

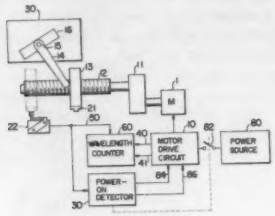
a driver unit for rotating said dispersion element through a predetermined angular range;

a wavelength counting pulse generator for producing wavelength counting pulses, at least one counting pulse being produced with every variation of the angular position of said dispersion element corresponding to a predetermined increment in variation of the tuning wavelength of said dispersion element;

a counter for adding to or subtracting from a set value the

number of said wavelength counting pulses depending on the rotational direction of said dispersion element;

means for producing a calibrating pulse in response to a predetermined angular position of said dispersion element in said predetermined angular range, comprising a member movable in accordance with the rotation of said dispersion element, and a switch disposed in the moving path



of said member for producing an electrical signal when the dispersion element is located at said predetermined angular position; and

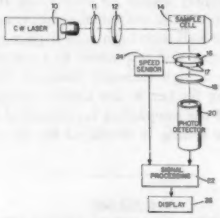
means for setting said counter to said set value in response to said calibrating pulse, said set value corresponding to the tuning wavelength of said dispersion element when it is positioned at said predetermined angular position.

4,203,670

SYSTEM AND METHOD OF FLUORESCENCE POLARIMETRY

Nathan S. Bromberg, 461 Conant Rd., Weston, Mass. 02193

Filed Apr. 21, 1977, Ser. No. 789,636
Int. Cl.[2] G01N *21/40*
U.S. Cl. 356—367 **39 Claims**



1. A fluorescene polarimeter comprising:

an illumination source providing a defined, narrow band light beam;

a sample cell for containing a sample solution and disposed to receive light from said illumination source and to permit fluorescent radiation from a sample solution;

an analyzer;

means for providing continuous rotation of said analyzer;

an optical filter receiving fluorescent radiation from said sample cell and having a pass band centered at the emission frequency of said fluorescent radiation;

photodetector means operative in response to radiation passed by said optical filter to provide an electrical output signal representative of radiation intensity;

signal processor means operative in response to the output signal from said photodetector means and including;

means for providing first and second signals respectively representative of the difference component and the sum component of fluorescence polarization;

means providing a time interval representing the ratio of said first signal to said second signal and including:

first integrator means receiving said second signal and providing a first integrated output signal;

second integrator means receiving a signal derived from said first signal and providing a second integrated output signal of maximum level determined by the maximum level of said first integrated output signal; and

means causing the discharge of said second integrator means at a uniform rate to provide said time interval; and

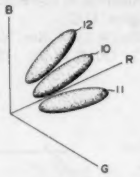
means operative in response to said time interval to provide a signal representative of polarization of fluorescence.

4,203,671

METHOD OF DETECTING FLESH COLOR IN COLOR ORIGINALS

Koji Takahashi; Taizo Akimoto, and Shigeru Watanabe, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 22, 1977, Ser. No. 809,078
Claims priority, application Japan, Jun. 22, 1976, 51/73576
The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.
Int. Cl.[2] G03B *27/76*
U.S. Cl. 356—402 **7 Claims**



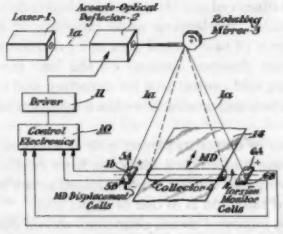
1. A method of detecting flesh color in a color original comprising defining a flesh color point as one whose red, green and blue densities fall within a solid having an elliptical cross section when plotted in a three-dimensional coordinate system the three axes of which represent the red, green and blue densities or combination thereof, measuring the red, green and blue densities of a number or points in the original, and determining that any given point is of flesh color when the measured red, green and blue densities are within said solid in the three-dimensional coordinate system.

4,203,672

SCANNING BEAM DISPLACEMENT COMPENSATION CONTROL SYSTEM

Edmund H. Smith, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 18, 1976, Ser. No. 743,003
Int. Cl.[2] G01N *21/18*; G01B *11/26*
U.S. Cl. 356—431 **14 Claims**



4. A closed loop control system for repetitively laterally repositioning a cyclically scanning beam of radiation to a preselected scan path comprising

a first radiation sensitive detector located on only a portion of said scan path with its sensitive surface oriented towards said radiation beam, said radiation beam impinging on said sensitive surface and developing a momentary lateral position-dependent electrical signal having a distinctive portion thereof representative of coincidence of said radiation beam with said scan path, and radiation beam deflection means responsive to said electrical signal for laterally repositioning said radiation beam on each scan into close conformity with said scan path; said first detector is a dual cell type in which said radiation beam impinges concurrently on said dual cells, thereby developing said momentary electrical signal proportionate in magnitude to the area difference in which said radiation beam overlies one cell in comparison with the other; and

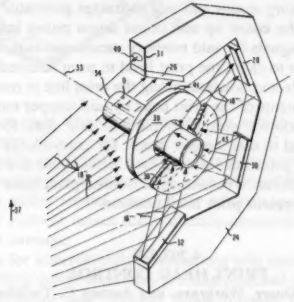
a second said radiation sensitive detector located at the end of said scan path for developing a momentary position-dependent electrical signal and wherein said radiation beam is monochromatic radiation and said deflection means comprises a voltage-controlled oscillator, said first detector being located at the beginning of said scan path, means responsive to said momentary position-dependent electrical signals only at the beginning and end of each scan, for generating a time varying beam displacement control voltage for input to said voltage-controlled oscillator, and an acousto-optical beam deflector responsive to said voltage-controlled oscillator bringing said radiation beam laterally and torsionally into close conformity with said preselected scan path.

4,203,673

METHOD AND APPARATUS FOR OPTICALLY INSPECTING CYLINDRICAL ARTICLES

Gerald I. Buckson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 26, 1978, Ser. No. 872,499
Int. Cl.² G01N *21/48*
U.S. Cl. 356—446 **14 Claims**



1. A method of optically inspecting the peripheral surface of an elongated generally cylindrical article having an axis comprising the steps of:

successively scanning said surface transversely of said axis with moving beams of light directed from each of a plurality of different circumferential locations, said beams of light lying in a plane

sensing the intensity of light non-specularly reflected from said surface from each of said locations simultaneously at different axial locations on either side of said scanning position, said non-specularly reflected light being sensed simultaneously at a small angle relative to said plane of said light beams and at all circumferential positions about said axis,

varying the position of said scanning along said axis by moving said article along said axis, and

comparing variations in said reflected light intensity.

4,203,674

USE OF BLOOD IN THE CEMENT, MORTAR AND CONCRETE INDUSTRY FOR OBTAINING A LIGHTENED MATERIAL

Charles Laleman, 80 Ile de Migneaux, Poissy, France (78300)

Filed Dec. 5, 1977, Ser. No. 857,413
Claims priority, application France, Dec. 14, 1976, 76 37653
Int. Cl.² B28C *5/00*
U.S. Cl. 366—2 **11 Claims**

1. A process for preparing a light weight cementitious material, wherein:

(a) a mixture of cement and of sand, and

(b) at least one air entraining colloid in powder form selected from the group consisting of dried whole blood, globules, red corpuscles and haemoglobin,

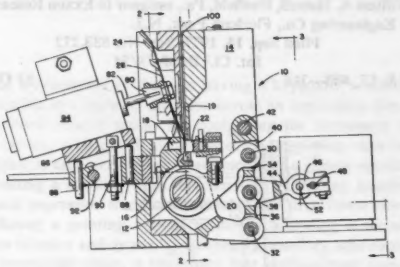
are associated together with stirring, in the presence of water, the quantity of air entraining colloid being between 0.1 and 1% by weight with respect to the weight of the cement contained in the mixture (a).

4,203,675

PRESSURE PRINTER

Miroslav Osmera, Waterloo; Rudolf Enter, Kitchener, and Robert McCallum, Erin, all of Canada, assignors to NCR Canada Ltd. - NCR Canada Ltee, Mississauga, Canada

Filed Aug. 28, 1978, Ser. No. 937,350
Int. Cl.² B41J *1/30*
U.S. Cl. 400—144.2 **5 Claims**



1. Means for transferring ink from an ink medium onto a record medium comprising a:

character bearing member, a

first swingably movable member, a

second swingably movable member, said ink medium and said record medium being positioned between said first member and said second member, a

common pivot member for supporting said first movable member and said second movable member, and

means including a pivot member and toggle members carried therefrom to allow swinging movement of said toggle members from said pivot member and connected for simultaneously moving said first member and said second member toward each other and into engagement with said ink medium and said record medium upon contact with said character bearing member.

4,203,676

RIBBON MOUNTING APPARATUS

William A. Hatsell, Hatfield, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 14, 1977, Ser. No. 833,352
Int. Cl.² B41J *33/14*
U.S. Cl. 400—208 **19 Claims**

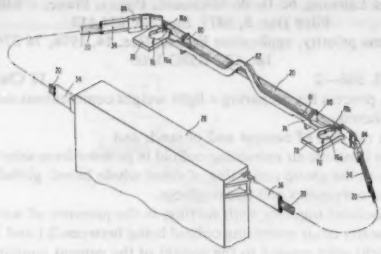
1. A removable ribbon storage apparatus for an impact printer of the type having a print point adjacent a print receiv-

ing medium and a character element striking said medium at said print point, said apparatus comprising:

a housing for storing ribbon;

a ribbon;

substantially rigid bridge means over which said ribbon passes;



a flexible leader extending between said bridge means and said housing for guiding said ribbon while permitting said bridge means to move relative to said housing; and

said ribbon being supported by and remaining in substantially the same position relative to said bridge means during printing and after removal from said impact printer.

4,203,677

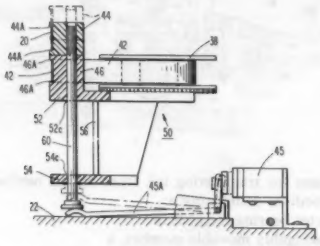
PRINTER RIBBON LIFT ASSEMBLY

William A. Hatsell, Hatfield, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 14, 1977, Ser. No. 833,272

Int. Cl.[2] B41J *33/54*

U.S. Cl. 400—214 **13 Claims**



1. An assembly for elevating a print ribbon and an erase ribbon to the print point of an impact printer, both said print ribbon and said erase ribbon being normally located at a rest position near said print point, said assembly comprising:

a pair of print ribbon lifters, one of said print ribbon lifters being positioned on each side of said print point, said print ribbon lifters defining a print ribbon path therebetween;

a pair of erase ribbon lifters, one of said erase ribbon lifters being positioned on each side of said print point, said erase ribbon lifters defining an erase ribbon path therebetween, said erase ribbon path and said print ribbon path being substantially vertically arranged with respect to one another when said ribbons are in their rest positions;

a first means for selectively elevating one pair of said lifters without disturbing the other pair of said lifters whereby one of said ribbons is intermittently positioned adjacent said print point and returned to said rest position; and

a second means for selectively elevating said other pair of lifters whereby the other of said ribbons is intermittently positioned adjacent said print point and returned to said rest position.

4,203,678

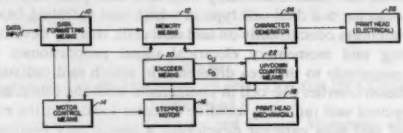
ELECTRONIC CONTROL CIRCUIT FOR A HIGH SPEED BIDIRECTIONAL PRINTER

Larry A. Nordstrom, Oviedo, and Daniel J. Szechy, Sanford, both of Fla., assignors to Scope Data Incorporated, Orlando, Fla.

Filed Aug. 17, 1978, Ser. No. 934,423

Int. Cl.[2] B41J *19/30*; G05B *19/40*

U.S. Cl. 400—320 **29 Claims**



1. An electronic control circuit for a high speed printer having a character generator coupled to a print head which forms characters as the print head is laterally displaced along a print line by a stepper motor, said control circuit comprising:

a. encoder means coupled to said stepper motor for generating count up pulses when said stepper motor displaces the print head in a first direction and count down pulses when said stepper motor displaces the print head in a second direction, the count up and count down pulses continuously defining the present print head position;

b. memory means for receiving electronic signals representative of printable characters during a load cycle and for reading out printable characters to the character generator during a print cycle;

c. means coupled to said memory means for formatting input data to be printed, loading said memory means with the formatted data, computing a desired print head position during each load cycle and initiating the print cycle at the end of each load cycle;

d. up/down counter means coupled to said encoder means, said memory means and said character generator for converting the count up and count down pulses into digital address signals for said memory means and said character generator to cause the print head to print selected characters at selected positions along the print line in response to displacements of the print head by said stepper motor; and

e. motor control means coupled to said data formatting means and to said stepper motor for controllably accelerating the print head during each print cycle as a function of the difference between the desired print head position and the present print head position.

4,203,679

PRINT HEAD CONTROL

Jonathan H. Duerr, Wargrave, and Antony C. Twitchen, High Wycombe, both of England, assignors to Trend Communications Limited, London, England

Filed Sep. 28, 1977, Ser. No. 837,417

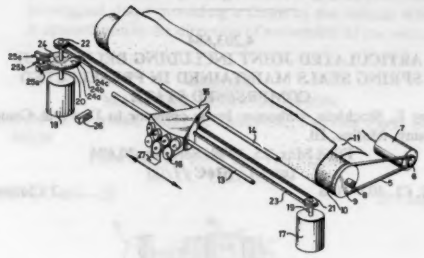
Claims priority, application United Kingdom, Sep. 30, 1976, 40569/76

Int. Cl.[2] B41J *19/00*

U.S. Cl. 400—320 **20 Claims**

1. In a printer having a print head arranged to be traversable along a path and capable of imprinting characters on to paper supported adjacent said path, the improvement comprising providing first and second servo-motors mounted adjacent said path along which the head is traversed, a flexible tension element coupling said head to each servo-motor whereby driving said first servo-motor pulls the head along a printing traverse and driving said second servo-motor pulls the head along a fly-back traverse, and control means having two connection modes in the first of which said first servo-motor is energized to pull the head on the printing traverse and said second servo-

motor is connected as a dynamic brake, and in the second of which said second servo-motor is energized to pull the head on



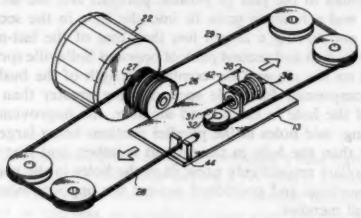
the fly-back traverse and said first servo-motor idles at least for the greater part of the fly-back traverse.

4,203,680

HIGH-SPEED PRINTER WITH SELF-ADJUSTING CABLE PRELOAD MECHANISM

Svetislav Mitrovich, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 10, 1978, Ser. No. 922,891
Int. Cl.[2] B41J *19/00*
U.S. Cl. 400—335 **1 Claim**



1. A carriage driving mechanism for a high-speed printer comprising:

a movable carriage for carrying a printing unit along a predetermined line of printing, said carriage including friction pulley means mounted for rotation on said carriage and resilient means for resiliently connecting a cable to said carriage;

means for intermittently transporting said carriage and said printing unit to stationary printing positions along said line of printing, said carriage being movable from a center position to extreme left and right positions, such transporting means including a motor and a second pulley means driven by said motor;

a frame for accommodating said carriage and motor;

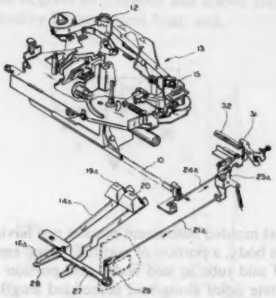
cable segments coupling said second pulley means to said carriage, each of said cable segments having an end affixed to said second pulley means, said second pulley means having peripheral wrapping surfaces for wrapping approximately equal lengths of said cable segments on said surfaces when said carriage is in said center position, and for respectively accommodating a substantially greater length of one cable segment than the other when said carriage is in one of said extreme positions, said cable segments being respectively wrapped around said second pulley means in opposite directions, the other ends of said cable segments being affixed to said carriage, at least one of said segments being wrapped around said friction pulley means and being attached to said resilient means.

4,203,681

SINGLE ELEMENT TYPEWRITER WITH ERROR CORRECTION FEATURE

John C. Gall, Chicago; Chester E. Ozimek, Park Ridge, and Albert E. Chamberlain, Lake Bluff, all of Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.

Filed Nov. 25, 1977, Ser. No. 854,534
Int. Cl.[2] B41J *29/26*
U.S. Cl. 400—697 **1 Claim**



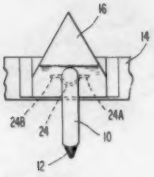
1. In a typewriter of the type having a keyboard, a carrier translatable in a linewise direction across an impression sheet, escapement control means for controlling the movement of said carrier, a single element character imprinting member mounted on said carrier, first means including a ribbon vibrator for feeding a marking tape between said imprinting member and said impression sheet and for raising said first ribbon vibrator during a printing operation, means including a second ribbon vibrator and means for feeding a correcting tape across said impression sheet, a backspace key and keylever operatively connected with said carrier, an escapement torque bar operatively connected to said escapement control means, a mode actuating bell crank, an escapement trigger operatively connected to said bell crank and normally engageable with said escapement torque bar for rendering the escapement effective, the improvement comprising an obliterating type font carried on said single element imprinting member, a correcting key associated with a connecting keylever operatively connected to said imprinting member, means operatively connecting said correcting keylever to said mode actuating bell crank whereby actuation of said correcting keylever will render the escapement control means ineffective to prevent movement of the carrier, lift the correcting tape in imprinting position and actuate the imprinting member to impinge the type font on said correcting tape, said backspace key and keylever being operatively independent of said correcting key and keylever, each successive actuation of said correcting key in each case inhibiting movement of said carrier but returning the control means to normal operational mode following each impingement of said type font on said correcting tape, and said connecting means between said correcting keylever and said mode actuating bell crank comprising a forward extension on said last-mentioned keylever, a shaft rockably supported and extending transversely of said extension, a first rigid arm on said shaft engageable by said extension, a second rigid arm on said shaft longitudinally displaced from said first arm, and link means connecting said second rigid arm to said actuating bell crank.

4,203,682

INSERT MOLDED INSTRUMENT MARKER PEN WITH ANCHORED STYLUS

William W. Hepworth, Haddonfield, N.J., assignor to Graphic Controls Corporation, Cherry Hill, N.J.

Filed Jul. 10, 1978, Ser. No. 922,840
Int. Cl.[2] B43K 1/12
U.S. Cl. 401—198 **10 Claims**



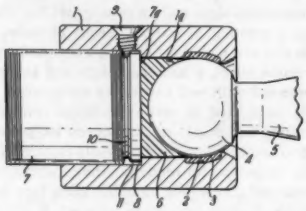
1. Insert molded instrument marker pen having a stylus tube and a pen body, a portion of said tube being embedded along a length of said tube in said body, said portion including at an intermediate point along said embedded length, an embedded anchoring projection attached to the outer surface of said tube, said anchoring projection, in cross-sectional shape, being a "U", the curvature of which corresponds to the outer curvature of said tube, said "U" having flanges at the upper ends thereof extending radially outwardly from said tube.

4,203,683

BALL JOINTS

Peter R. Rogers, Neath, Wales, assignor to Cam Gears Limited, Hertfordshire, England

Filed Apr. 7, 1978, Ser. No. 894,491
Claims priority, application United Kingdom, Apr. 12, 1977, 15041/77
Int. Cl.[2] F16C 11/00; F16D 1/12
U.S. Cl. 403—132 **11 Claims**



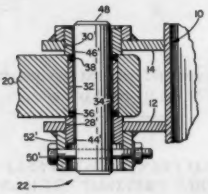
1. A ball joint comprising a housing having a bore therein, a ball received in said bore, means capable, in use, of restraining said ball against excessive penetration into sid bore, a portion of said bore of smaller diameter than said ball being capable of restraining the ball against withdrawal from said bore, a bearing annulus of synthetic plastics material having a low coefficient of friction and good wearing characteristics which partly defines said smaller diameter portion of said bore, said bearing annulus having a face generally converging in the direction of withdrawal of said ball and against which said ball bears in its restrained condition, an annular recess in said housing in which said bearing annulus is received in complementary manner, and said ball having substantially the same diameter as the portion of said bore formed in said housing in which said ball is restrained, said means capable, in use, of restraining the ball against excessive penetration into the bore comprising a bearing cap that is adapted to be subjected to a predetermined pressure, said housing defining a shoulder in the bore, and a plug, which is capable of engaging the shoulder from the side of the bore remote from the ball, subjects the bearing cap to said predetermined pressure, said cap standing proud of the shoulder when in engagement with the ball and when not being subjected to said predetermined pressure.

4,203,684

ARTICULATED JOINT INCLUDING BELLEVILLE SPRING SEALS MAINTAINED IN PRESELECTED COMPRESSED STATE

Gary L. Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 15, 1979, Ser. No. 20,694
Int. Cl.[2] F16C 11/00
U.S. Cl. 403—158 **2 Claims**



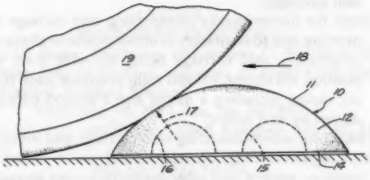
2. In an articulated connection between first and second members, the first member including a pair of parallel portions disposed on opposite sides of and pivotally interconnected to the second member by a pivot pin assembly including aligned holes located in the pair of parallel portions and the second member and a bushing press fit into the hole in the second member and having a length less than that of the last-mentioned hole; first and second pairs of opposed Belleville springs received on the pin and the combined length of the bushing and uncompressed Belleville springs being greater than the length of the hole in the second member, the improvement, comprising: said holes in the parallel portions being larger in diameter than the hole in the second member; and first and second collars respectively press fit in the holes in the pair of parallel portions and positioned against the opposite sides of the second member.

4,203,685

AUTOMOTIVE VEHICLE SPEED ARRESTOR

Richard E. Sanchez, 8548 Manatee St., Downey, Calif. 90240

Filed May 5, 1978, Ser. No. 903,077
Int. Cl.[2] E01F 13/00
U.S. Cl. 404—6 **5 Claims**



5. A speed bump for securement to a roadway surface over which automotive vehicles pass, comprising:

an elongated body member having a generally rectangular flat mounting surface and a second surface upwardly disposed when installed on the roadway, said second surface being convexly upwardly curved about a body member longitudinal axis;

a quantity of adhesive securing the body member flat surface to the roadway surface;

said body member being constructed of molded synthetic plastic and including a pair of spaced, generally parallel,

longitudinally extending channel-like openings a part of which openings interrupt the mounting surface, the synthetic plastic being sufficiently resilient to compressingly deform on a vehicle passing thereover and on recovering its original shape providing a thrust to the vehicle which is upward and in the direction of movement of the vehicle.

4,203,686

MANHOLE CONSTRUCTION

Harold M. Bowman, 18867 N. Valley Dr., Fairview Park, Ohio 44126

Filed Jul. 17, 1978, Ser. No. 925,390
Int. Cl.[2] E02D *29/14*
U.S. Cl. 404—25 **10 Claims**

1. In a manhole cover assembly including a base frame defining a manhole opening and having a peripheral annular inner seat for receiving a manhole cover, an annular manhole cover seated on said seat, an annular retainer ring coacting with said cover and said frame for holding said cover in place on said seat, whereby said cover and said ring coact to present a substantially common flush surface with the top of said base frame, said retainer ring including means coacting with means on said frame for removably securing said retainer ring and said cover to said frame.

4,203,687

UNDER WATER CRANE

Maurice N. Sumner, Houston, Tex., assignor to The Sea Horse Corporation, Houston, Tex.

Division of Ser. No. 588,761, Jun. 20, 1975, Pat. No. 4,109,480. This application May 12, 1978, Ser. No. 905,131
Int. Cl.[2] F16L *1/04*
U.S. Cl. 405—170 **6 Claims**

1. The system for connecting pipeline ends underwater comprising:

A first underwater hoisting and handling frame comprising:

a vertically powered vertically travelling runway beam means, a laterally powered trolley means travelling along said beam means, footing means for supporting the frame on the marine floor, and framework coupling said beam and footing means, wherein said beam means is vertically powered by thrusting means at each end independently of the other end, thereby freeing said framework of stresses of synchronization,

a second underwater hoisting and handling frame comprising:

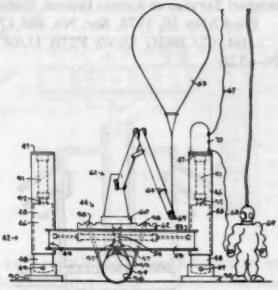
a vertically powered vertically travelling runway beam means,

a laterally powered trolley means travelling along said beam means,

footing means for supporting the frame on the marine floor,

framework compling said beam and footing means,

wherein said beam means is vertically powered by thrusting means at each end independently, thereby freeing said framework of stresses of synchronization and jib crane means mounted on top thereof, allowing handling of a first load in three degrees of freedom and above said trolley while said trolley lifts a second load, and,



other independent submerged hoisting means, wherein

(a) said other means is for mounting apart from said pipeline ends for holding at least one of said pipeline ends flexibly disengaged from the marine floor,

(b) said frames are for mounting near said pipeline ends to handle said ends into alignment, and

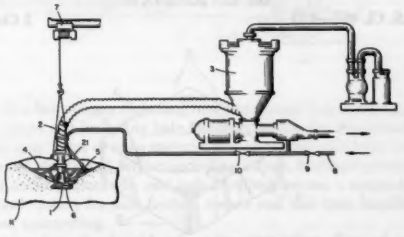
(c) said jib crane is for handling pipeline coupling means into place proximate to said pipeline ends.

4,203,688

METHOD OF UNLOADING BULK MATERIALS FROM VESSELS

Max M. Shapunov; Mikhail A. Koppel; Felix M. Frumkin; Evgeny I. Zvenigorodsky, all of Lenigrad, U.S.S.R., and Antal Gabor, Tatabanya, Hungary, assignors to Zavod Stroitelnykh Mashin, Leningrad, U.S.S.R.

Division of Ser. No. 871,394, Jan. 23, 1978, Pat. No. 4,165,135. This application Apr. 23, 1979, Ser. No. 32,295
Int. Cl.[2] B65G *53/42*
U.S. Cl. 406—85 **4 Claims**



1. A method of unloading bulk materials from vessels, comprising the following steps:

vibrating bulk material to be unloaded within an intake zone to thereby mechanically loosen the material;

supplying aerating air flow into said bulk material in said intake zone simultaneously with said vibrating of said bulk material;

said aerating air flow being supplied towards an inlet opening of a taking means in pulses whose frequency is syn-

chronized with the frequency of said vibrating of said bulk material;

maintaining a vacuum within said taking means so that loosened and aerated bulk material is sucked into said taking means; and

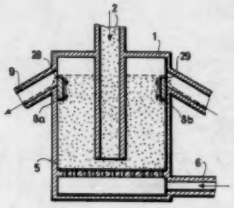
transporting said bulk material from said taking means by virtue of air.

4,203,689

SELF-ADJUSTING POWER DISTRIBUTOR

Istvan Kraxner; Antal Sebok; Janos Steiner, all of Budapest, and Jozsef Toth, Almasfuzito, all of Hungary, assignors to Aluminiumpari Tervezo es Kutato Intezet, Budapest, Hungary

Filed May 10, 1978, Ser. No. 905,171
Int. Cl.[2] B65G *53/40*; F27B *15/08*
U.S. Cl. 406—123 2 Claims



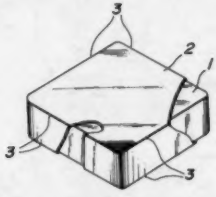
1. A self-adjusting powder distributor for alumina calcination apparatus comprising a closed casing, a powder fluidizing bottom in said casing, an inlet for supplying hydrate into the casing above said fluidizing bottom, outlets in said casing having discharge edges at the same level for distributing the hydrate from said casing to various places at a constant ratio, at least one of the outlets having means for altering its flow area and, thereby, the ratio of flow therethrough with respect to the other outlets, and means for altering the common level of said discharge edges and, thereby, the inventory of said hydrate in the distributor while maintaining said discharge edges always at a common level.

4,203,690

CERAMIC CUTTING TIP

Hiroshi Tanaka, Aichi, and Kenji Sakurai, Komaki, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 687,758, May 19, 1976, abandoned.
This application Sep. 8, 1978, Ser. No. 940,772
Claims priority, application Japan, May 23, 1975, 50-69816
Int. Cl.[2] B27G *15/00*
U.S. Cl. 407—119 2 Claims



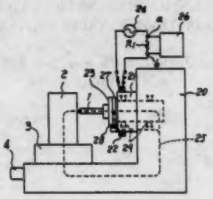
1. A ceramic cutting tip of the throw-away type comprising a ceramic sintered body having at least two cutting blades and covered on at least a cutting blade portion with a metal coating having a thickness of 1–10μ, said cutting blades being adapted to be employed in succession, wherein the metal employed in the metal coating is selected from the group consisting of nickel, cobalt, aluminum and copper.

4,203,691

CONTACT DETECTING APPARATUS

Hideo Nishimura, Aichi; Shigeo Noda, Nagoya, and Kunihiko Eto, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 7, 1978, Ser. No. 958,363
Claims priority, application Japan, Nov. 14, 1977, 52-136554
Int. Cl.[2] B23B *39/04, 9/00, 39/06*
U.S. Cl. 408—8 3 Claims



1. In a machine tool including a machine body, a work table mounted on said machine body for mounting thereon a workpiece to be machined, a spindle head mounted on said machine body, a tool spindle rotatably supported through bearings in said spindle head for supporting a tool, and control means for effecting relative movement between said work table and said tool spindle, a contact detecting apparatus comprising:

an AC power source;

a coil mounted on the periphery of said spindle head and connected to said AC power source for generating an induced current in a looped secondary circuit including the workpiece, work table, machine body, spindle head, tool spindle and tool, when said workpiece and said tool are moved relatively into contact with each other;

means included in said secondary circuit for bypassing an electric resistance in said bearings; and

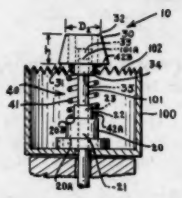
means connected between said AC power source and said coil for detecting a change in an electric signal caused by the contact between said workpiece and said tool.

4,203,692

SELF-CENTERING HOLE SAW ADAPTER

Roger S. Jensen, Box 186, Garland, Utah 84312

Filed Dec. 20, 1978, Ser. No. 971,589
Int. Cl.[2] B23B *41/00*
U.S. Cl. 408—96 5 Claims



1. A self-centering hole saw adapter, for use in combination with a toothed edge hole saw having a shaft centrally disposed within the hole saw and connected thereto, and with said shaft having a portion thereof protruding beyond said toothed edge of said hole saw, comprising:

a. a first member having a first hole therein and therethrough complementary to said centrally disposed shaft, with said first member removably mounted on and fitted over said shaft, through said first hole;

b. a second member in the geometric form of a frustum of a right circular cone having a circular base with a diametric width; a circular section parallel to, oppositely disposed to, and less diametrically wider than, said base; and, a first

hole therein and therethrough extending from said base to said parallel section, with said first hole complementary to said centrally disposed shaft, and with said first member removably mounted on and fitted over said shaft through said first hole, and also with said base of said second member facing said first member;

c. and, an elastic and resilient body interposed between, and releasably interconnecting, said first member and said second member, with said body removably mounted on and fitted over said shaft;

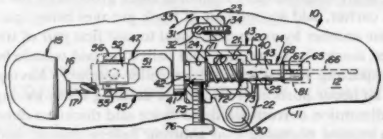
whereby said first member, said second member, and said elastic and resilient body are in alignment, are releasably interconnected, and form a one-piece unit, and whereby said one-piece unit is, in and of itself, removably mounted on and fitted over said shaft in either a "first member-up" position or a "second member-up" position, with said unit extending beyond said protruding portion of said shaft.

4,203,693

DUPLICATING MACHINE FOR TUBULAR KEYS

Jerome Schwartz, and Joseph Levitt, both of Philadelphia, Pa., assignors to Taylor Lock Company, Philadelphia, Pa.

Filed Jul. 27, 1978, Ser. No. 928,580
Int. Cl.² B23C 1/16
U.S. Cl. 409—81 **11 Claims**



1. A duplicating machine for tubular keys, said machine comprising: a base, a generally cylindrical cutter rotatably mounted about an axis and having a cutting face transverse to said cutter axis; on said base and having a radius generally equal to the radius of a tubular key notch, a mount at a fixed location on said base spaced from said cutter, a key carrier supported by said mount for shifting movement on an axis parallel to the axis of said cutter and rotative movement to spaced angular locations relative to the axis of said carrier, a work holder on said carrier for gripping engagement with the stem of a blank key to be cut by said cutter upon longitudinal carrier shifting movement, a control holder on said carrier for holding a key to be duplicated with its stem in fixed generally parallel and aligned relation with the stem of a gripped key blank, and a guide having a radius generally equal to the radius of a tubular key notch fixed relative to the axis of said cutter, said guide having an axis parallel to the axis of said cutter and located in similar relation to a key on the control holder as a key blank held by the work holder is located relative to the cutter, whereby control holder movement by a key to be duplicated in guided relation with said guide effects carrier shifting and rotative movement for corresponding cutting by said cutter of a key blank held by said work holder.

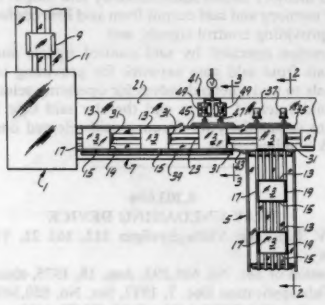
4,203,694

SQUARING REAMS OF PAPER FOR WRAPPING

Robert C. James, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed May 15, 1978, Ser. No. 905,634
Int. Cl.² B65H 9/10
U.S. Cl. 414—28 **4 Claims**

1. Apparatus for feeding reams of paper to a wrapping apparatus and squaring up the reams as they are fed comprising means for feeding the reams forward one after another with two opposite sides of each ream extending generally in the direction of feed and the other two opposite sides extending generally transversely of the direction of feed, said feeding means comprising a conveyor having a stationary surface over which the reams may be pushed, endless conveyor means having a series of pushers thereon adapted to extend up above the reams at the rear of the reams for pushing the reams over said surface, said endless conveyor means being movable continuously relative to said surface for continuous delivery of reams of paper to the wrapping apparatus, and means engageable with at least one of said two opposite sides of each ream



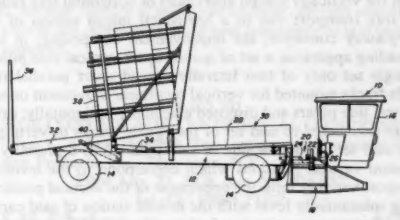
for subjecting each ream being pushed forward by said pushers to forces applied repetitively transversely of the ream thereby to attain register of the sheets of the ream in the transverse direction, with the frictional resistance between the sheets of the ream as the latter is pushed forward and said means applying the force being effective to bring the sheets back against a respective pusher thereby to attain register of the sheets of the ream in the longitudinal direction.

4,203,695

AUTOMATIC BALE WAGON CONTROL SYSTEM

Edward J. Wynn, Leola, and Cal L. Bryant, Lancaster, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 14, 1978, Ser. No. 933,233
Int. Cl.² B65G 57/32
U.S. Cl. 414—40 **12 Claims**



1. In a bale wagon including first and second bale accumulating means and including bale handling means for sequentially picking up bales of crop material and arranging said bales into tiers and stacks, and further including means, feeding hydraulic fluid under pressure to said bale handling means, a sequential control system for said feeding means and said bale handling means comprising:

a plurality of solenoid valves for controlling flow of said hydraulic fluid,

an electronic gate network,

a plurality of sensors for feeding data to said gate network representative of the operation state of said bale handling means,

first counter means providing output data representative of the number of completed cycles of said first accumulating means has during a loading sequence,

second counter means providing output data representative

of the number of completed cycles of said second accumulating means has during a loading sequence,

first memory means having stored therein data representative of a plurality of individually selectable stack configurations,

means for addressing said first memory means with a signal representative of a selected one of said stack configurations and said output data from said second counter means and providing an output from said first memory means,

second memory means addressable by said output from said first memory and said output from said first counter means for providing control signals, and

latch means operated by said control signals and output signals from said gate network for providing command signals to said solenoid valves for operating selected ones of said solenoid valves and thereby said bale handling means sequentially for forming said selected one of said stack configurations.

4,203,696

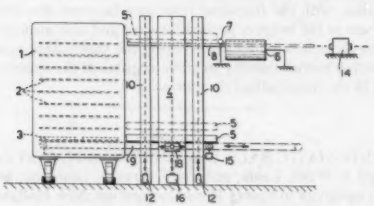
TRAY UNLOADING DEVICE

Gunnar V. Lindberg, Vällingbyvägen 212, 162 21, Vällingby, Sweden

Continuation of Ser. No. 605,292, Aug. 18, 1975, abandoned. This application Dec. 7, 1977, Ser. No. 858,345

Int. Cl.[2] **B65G** *1/00, 47/00;* **E04H** *6/06*

U.S. Cl. 414—331 **3 Claims**



1. In combination, a tray transport van with vertically spaced apart pairs of horizontal tray rails, carry-away conveyor and a tray unloading apparatus for transferring trays from the vertically spaced apart pairs of horizontal tray rails in the tray transport van to a horizontal infeed station of the carry-away conveyor, the improvement comprising, in said unloading apparatus, a set of spaced apart vertical side pillars; a single set only of two laterally spaced apart parallel tray guide tracks mounted for vertical rectilinear movement on said vertical side pillars and disposed essentially horizontally; drive means connected to said set of tray guide tracks to vertically shift said set along one side of said pillars into a plurality of different vertical positions which correspond to the levels of transport van tray rails, the uppermost of the vertical positions being substantially level with the in-feed station of said carry-away conveyor so a tray can be laterally shifted from the tray guide tracks onto said carry-away conveyor at the upper level; a second set of vertical side pillars located adjacent said first mentioned set of side pillars; a horizontal outfeeding continuous belt conveyor located below and between said set of tray guide tracks and mounted on said second set of pillars for independent selective vertical and horizontal movement as a unit, vertically to a plurality of levels equal to the levels of trays in the van, and horizontally so that a portion of the continuous belt conveyor can be positioned into the van between the van tray rails and raised to any selected level of a pair of said van tray rails to engage and carry trays from the van to said set of vertically shiftable tray guide tracks; means for vertically shifting said belt conveyor; means for horizontally moving said belt conveyor as a unit; and means located adjacent the top portion of said vertical side pillars at the upper level position of said set of vertically shiftable tray guide tracks, comprising a laterally shiftable horizontal tray shifter to engage and shift any tray on the set of tray guide tracks to the in-feed station of said carry-away conveyor, and means for shifting said tray shifter.

4,203,697

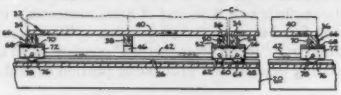
TRANSFER APPARATUS FOR PALLETIZED LOADS

David W. Cayton, Cupertino, Calif., assignor to Bud Antle, Inc., Salinas, Calif.

Filed Jun. 24, 1977, Ser. No. 809,785

Int. Cl.[2] **B60P** *1/64*

U.S. Cl. 414—345 **2 Claims**



1. Apparatus for transferring a group of loaded pallets from the bed of a vehicle to the bed of a carrier, the pallets including beams having a thickness dimension at the peripheral margins thereof, comprising means forming a first pair of parallelly spaced apart longitudinally extending track grooves on the bed of said vehicle, means forming a second pair of parallelly spaced apart longitudinally extending track grooves on the bed of said carrier, said second pair of track grooves being spaced from one another by an amount equal to said first pair of track grooves, means for supporting said pallets on said vehicle bed, said supporting means including a roller assembly having a frame, an upper portion of said frame defining a slot having a width dimension corresponding to twice said thickness dimension to receive beams of two abutting pallets therein, and a lower portion of said frame having means for supporting at least one roller for rotation about an axis parallel to the width dimension of the slot, said roller being engageable in said track grooves, means for aligning said carrier relative said vehicle so that said first pair of track grooves is in alignment with said second pair of track grooves, and means for drawing said pallets from said vehicle bed onto said carrier bed.

4,203,698

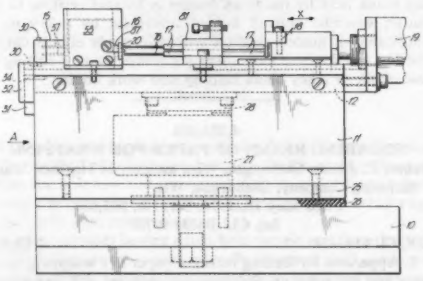
APPARATUS FOR SIMULTANEOUSLY LOADING A MULTIPLICITY OF PINS INTO A LOADING FIXTURE FOR A PIN INSERTION MACHINE

Jean M. Dupuis, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 27, 1978, Ser. No. 919,666

Int. Cl.[2] **H05K** *3/30*

U.S. Cl. 414—404 **5 Claims**



1. Apparatus for simultaneously loading a multiplicity of pins into a loading fixture for a pin insertion machine, comprising:

a support plate;

means for locating and holding a loading fixture on said support plate, said fixture having two rows of holes for receiving and holding pins;

a magazine on said support plate and having a plurality of vertical compartments, for holding pins in vertical rows, said compartments spaced to be aligned with the pin receiving holes of a loading fixture;

a plurality of elongate insertion members slidably mounted on said support plate, said insertion members arranged in two rows, an insertion member axially aligned with each compartment in said magazine, each insertion member comprising a tubular housing, a piston axially slidable in said housing and a pin extending axially from said piston out of said housing, and a compression spring behind said piston, and means for holding a template between said insertion member and said compartments in said magazine, said template having a predetermined pattern of holes therein corresponding to a predetermined distribution of pins to be inserted in said holding fixture, the arrangement such that an axial movement of said insertion members, the piston and associated pin can retract against said spring when a hole is not present in a turnplate whereby a pin is not transferred from said magazine to said holding fixture; and

actuating means for moving said elongate insertion members axially, whereby the insertion members enter said magazine and push a pin out of each compartment into a corresponding pin receiving hole in the loading fixture.

4,203,699

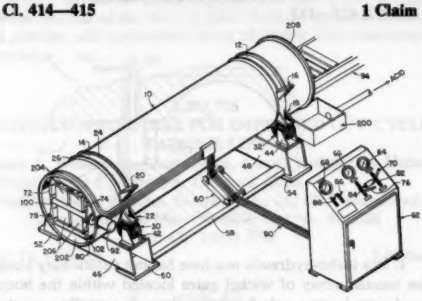
METHOD OF DUMPING AND COLLECTING CORROSIVE SUBSTANCES FROM AUTOMOTIVE BATTERIES

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 669,216, Mar. 22, 1976, Pat. No. 4,081,093. This application Jan. 3, 1978, Ser. No. 866,515

Int. Cl.[2] B65G *65/30*

U.S. Cl. 414—415 **1 Claim**



1. A method of draining acid from automotive storage batteries comprising the steps of:

(a) introducing said batteries in their upright position into an acid dumping apparatus;

(b) gripping the sides of said batteries with resilient gripping means;

(c) swinging said apparatus through an arc in a first direction by using resilient drive means until said batteries are in their inverted position;

(d) stopping said apparatus with said batteries in said inverted position by causing said resilient drive means to contact a stop on said apparatus thus shaking said batteries in said inverted position within said gripping members, whereby said shaking is amplified by interrelationship between said resilient gripping means and said batteries engaged thereby;

(e) swinging said batteries back through said arc in the opposite direction; and

(f) removing said batteries from said acid dumping apparatus.

4,203,700

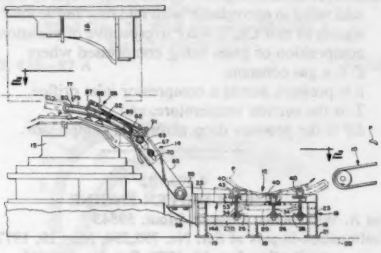
ARTICULATING PART HANDLING DEVICE

Joseph P. Seme, Sr., 17607 Egbert Rd., Walton Hills, Ohio 44146

Filed Feb. 21, 1978, Ser. No. 879,719

Int. Cl.[2] B65G *47/91*

U.S. Cl. 414—732 **8 Claims**



1. An articulating part handling device comprising a fixed frame having roller members thereon properly to locate a part during receipt thereof for subsequent handling, said roller members being adjustable in at least two directions properly to locate parts of varying sizes and shapes, an articulating arm assembly having at least two pivotally interconnected members, the proximal member of such pivoting arm assembly being pivotally mounted to said fixed adjacent its proximal end, a carriage slidably mounted to the distal member of said articulating arm assembly for selective movement therealong, a part support means on said carriage including plural selectively actuated part holding means selectively to secure the properly located part on said fixed frame to the part support means at several positions across the part, and actuating means selectively to pivot the articulating assembly relative to the fixed frame and/or to pivot the members of such articulating arm assembly relative to one another and/or slidably to move said carriage relative to said distal member, thereby selectively to change the orientation of the part selectively to said carriage as required.

4,203,701

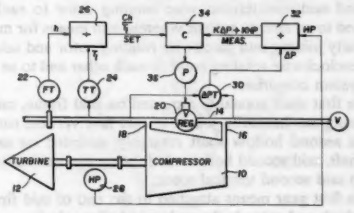
SURGE CONTROL FOR CENTRIFUGAL COMPRESSORS

William C. Abbey, Houston, Tex., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Aug. 22, 1978, Ser. No. 935,833

Int. Cl.[2] F04D *27/02*

U.S. Cl. 415—1 **4 Claims**



1. Apparatus for surge control of a centrifugal compressor comprising in combination:

means deriving signals proportional to suction temperature

and pressure differential across the inlet orifice of the compressor;

means for dividing said pressure signal by said temperature signal to provide a first control signal;

means for deriving signals proportional to power input to and pressure drop across the compressor;

means for adding said power and pressure drop signals to provide a second control signal;

a recycle line connecting the inlet and outlet of the compressor;

valve means in said recycle line; and

means for modulating flow in said recycle line by controlling said valve in accordance with said first and second control signals so that $Ch/T_i = \Delta P$ irrespective of variations in the composition of gases being compressed where

C is a gas constant,

h is pressure across a compressor inlet orifice,

T_i is the suction temperature, and

ΔP is the pressure drop across the compressor.

4,203,702

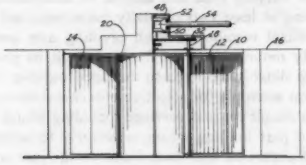
WATER DRIVEN ENGINE

Glen A. Williamson, Wagner, Mont. 59543

Continuation-in-part of Ser. No. 798,294, May 19, 1977. This application Jun. 30, 1978, Ser. No. 920,815

Int. Cl.[2] F01D *1/28*

U.S. Cl. 415—60 **3 Claims**



1. In a water driven engine comprising:

(a) a frame mounted in a stream of water;

(b) a first and second vertical rotor rotatably mounted in said frame and having a plurality of overlapping blades;

(c) a water diverter approximately centrally mounted forward of said first and second vertical rotors so that the flow of water which enters said frame is divided and diverted onto the rotor blades which are adjacent the sides of said frame, thereby rotating one of said rotors clockwise and the remaining rotor counterclockwise; and

(d) means for mechanically joining said clockwise rotating and said counterclockwise rotating rotor to each other and to an energy system wherein said means for mechanically joining said clockwise rotating rotor and said counterclockwise rotating rotor to each other and to an energy system comprises:

(e) a first shaft rotatably mounted on said frame, said shaft being mechanically joined to said first vertical rotor;

(f) a second hollow shaft rotatably mounted on said first shaft, said second hollow shaft being mechanically joined to said second vertical rotor;

(g) a first gear means attached to the end of said first shaft which end extends through said hollow shaft;

(h) a second gear means attached to the end of said hollow shaft which end is adjacent the first gear means attached to said first shaft; and

(i) means for mechanically joining said first and second gear means, the improvement wherein:

(j) said first shaft is mounted on said frame equidistant from said first and second vertical rotors;

(k) said first gear means is a downward projecting bevel gear;

(l) said second gear means is an upward projecting bevel gear; and

(n) said means for mechanically joining said first and second gear is one or more bevel gears,

wherein said first shaft is mechanically joined to said first vertical rotor by mechanical means comprising:

(o) a first planar gear attached to said first shaft;

(p) a second planar gear attached to the shaft of said first vertical rotor; and

(q) a chain drive mechanically joining said first and second planar gears; and

said hollow shaft is mechanically joined to said second vertical rotor by mechanical means comprising:

(r) a third planar gear attached to said hollow shaft;

(s) a forth planar gear attached to the shaft of said second vertical rotor; and

(t) a chain drive mechanically joining said third and forth planar gears.

4,203,703

HYDRAULIC TURBO MACHINE WICKET GATE SEALS

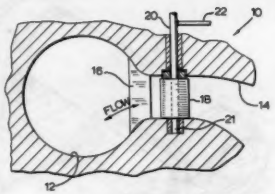
Paul Koeller, Dorval, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada

Filed Oct. 26, 1977, Ser. No. 845,546

Claims priority, application Canada, Nov. 4, 1976, 265082

Int. Cl.[2] F01D *11/00*; F01B *25/02*

U.S. Cl. 415—113 **2 Claims**



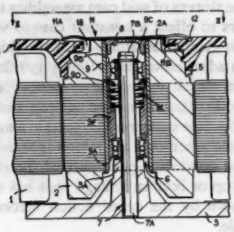
1. In a turbo-hydraulic machine having a stationary housing, an annular array of wicket gates located within the housing, each gate having a shaft portion thereof pivotally mounted in the housing the improvement comprising a large axial end clearance space provided between the array of wicket gates and the housing comprising a shrinkage allowance sufficient to accommodate relative closure of the housing gap, an annular cylinder concentric with the main axis of the machine in substantial axial coincidence with the wicket gates, an annular piston mounted in the cylinder for substantially unrestricted axial displacement therealong, a hydraulic supply connecting an inlet portion of said stationary housing with said cylinder, having pressure responsive diaphragm means therein to preclude the passage of contamination therethrough, a pair of seal rings extending about the radially inner and the radially outer peripheries of the annular piston in sealing relation with the walls of the cylinder and pressure fluid means connected to the cylinder to extend the piston axially outwardly towards the wicket gates in substantial end sealing relation therewith, to take up said axial end shrinkage clearance between said gates and said housing.

4,203,704

ELECTRIC FAN AND ESPECIALLY A FAN OF THE FLAT TYPE

Henri Saint-Amand, Antony, France, assignor to Etudes Techniques et Representations Industrielles E.T.R.I., Neuilly-sur-Seine, France

Filed Oct. 3, 1977, Ser. No. 839,287
Claims priority, application France, Nov. 23, 1976, 76 35220
Int. Cl.[2] F04D 25/08
U.S. Cl. 416—93 R 7 Claims



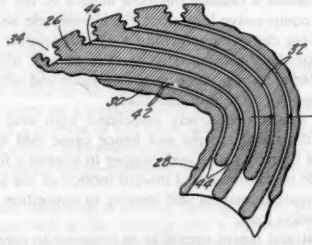
1. An electric fan and especially a fan of the flat type comprising a stator and a rotor forming a motor mounted within a housing, an impeller having a hub with a socket which fits over an annular end portion of the rotor, an axial passage within said rotor and a stationary shaft in said passage, one end of said shaft being secured to the housing and the other end being covered by a plug for sealing-off the axial passage of the rotor at the end nearest the impeller hub, an external cover-plate covering said plug and the annular end portion of the rotor which is associated with the impeller, said cover-plate having slots which open into a space located underneath said cover-plate in the vicinity of the annular end portion of the rotor in order to improve the cooling of said end portion by ventilation, said space being out of communication with the internal part of the motor, and elastic means applying said cover-plate against said end portion of the rotor in good thermal contact with said end portion, said cover-plate being of highly heat conductive material.

4,203,705

BONDED TURBINE DISK FOR IMPROVED LOW CYCLE FATIGUE LIFE

James J. Wesbecher, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 643,737, Dec. 22, 1975, abandoned. This application May 15, 1978, Ser. No. 906,306
Int. Cl.[2] F01D 5/08
U.S. Cl. 416—95 2 Claims



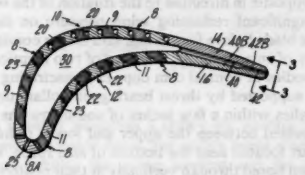
1. For a gas turbine engine a rotor disk of the type having a bore and a live rim of circumferentially continuous material, wherein the rotor disk is formed of a front member and a rear member which are metallurgically joined in an adjacent relationship and includes means formed between the front and rear members for providing a thermal profile characteristic to the disk, including a first region of nearly constant temperature running from the bore toward the live rim and a second region of substantially elevated temperature at the live rim and wherein said means for providing said thermal profile characteristic includes cooling conduits which are curved with increasing radius from the bore to the rim to maintain a substantially uniform material thickness therebetween.

4,203,706

RADIAL WAFER AIRFOIL CONSTRUCTION

W. Craig Hess, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1977, Ser. No. 865,356
Int. Cl.[2] F01D 5/18
U.S. Cl. 416—97 A 4 Claims



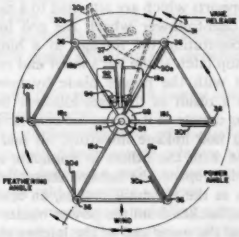
1. An airfoil shaped member having pressure and suction walls formed of radial wafers wherein the forward portion is formed of a plurality of parallel radial wafers bonded together having a hollow cavity therein for receiving a cooling fluid, cooling passages formed in the pressure and suction walls of said airfoil shaped member between the surface of abutting radial wafers, two side wafers bonded to the last parallel radial wafer and extending therefrom at an angle forming the trailing edge region of said airfoil shaped member, said side wafers having wavy grooves on the meeting surfaces thereof whereby the wavy grooves of each side are offset from each other in parallel planes, said grooves being connected to said cavity at one end and to the trailing edge of the blade at the other end, said wavy grooves of one side wafer crossing over the wavy grooves of the other side wafer, each groove on its side wafer forming a single passage.

4,203,707

WINDMILL WITH AUTOMATIC FEATHERING CONTROL AND STORM PROTECTION

William J. Stepp, 4241 Park Ave., Lake Station, Ind. 46405

Continuation-in-part of Ser. No. 530,830, Mar. 3, 1975, abandoned. This application Sep. 28, 1976, Ser. No. 727,352
Int. Cl.[2] F03D 7/06
U.S. Cl. 416—119 5 Claims



1. In a windmill of the vertical axis type there is a vertical rotatable tubular center shaft mounted on a thrust bearing at the bottom end in a base and held erect by a thrust and a stabilizing bearing at the top positioned in the center of two or

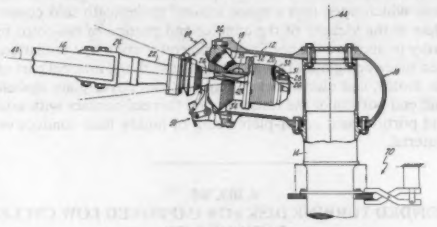
more intersecting trusses of which the outer ends extend beyond the periphery of the windmill and connected to guy wires or cables which are in turn anchored to the medium which holds the base, said tubular shaft having affixed thereto a plurality of radial arms, one set of arms located a few feet above the base bearing and another set spaced above the lower set and near the trusses at the top and so affixed to the tubular center shaft as to be geometrically congruent to the radial arms below, there being a swingable wind power blade suspended between each pair of the upper and lower matching radial arms, said blades vertical and parallel to the tubular center shaft of the windmill and journaled in bearings at the outer ends of the radial arms, said bearings receiving the ends of the axis posts of the swingable blades enabling each blade to rotate three hundred sixty degrees horizontally on its axis post during each rotation of the windmill, said type of windmill equipped with cam means provided to cause each blade to feather into a rotation opposite in direction to the rotation of the windmill by the last significant remaining wind pressure on the pressure side of the blade before feathering, said means consisting of the machinery of an apparatus comprised of two identical inverted frustum bodies or conical cam cups each encircling the center shaft and supported by thrust bearings in collars thereon, one of said bodies within a few inches of and below the top of the space provided between the upper and lower radial arms, its counterpart located near the bottom of said space, said bodies having been bored through vertically at their centers admitting sleeves firmly affixed therein, said sleeves slidably fit around the tubular center shaft of the windmill affording both vertical and rotational movement around the vertical center shaft, the sleeve of the upper frustum body extending a short distance inferiorly therefrom and the sleeve of the lower frustum body extending superiorly up and around the center shaft a short distance, said bodies rigidly connected one to the other by a directional control wind vane adjustably clamped to both sleeves, maintaining a rigid constant relationship to cams one to the other within the frustum bodies in both vertical and rotational movement around the center shaft, movable in unison, such rigidity effected by the aileron-equipped wind-direction-vane, said ailerons lift the vane and the frustum body cam assemblies in winds of intolerable velocities to feather all blades simultaneously, each of said cam assembly bodies having been machined or cast with a circular space inside, around the interior, outwardly from the sleeve for housing horizontal cam follower wheels, said space open at the bottom and extending the greater distance upwardly toward the top of the conical body, the inner and outer walls of said space elevationally parallel one to the other and angular to the vertical shaft in an outwardly upward direction, there being a cam lobe forming a part of the upper section of the outer wall of the cam-follower track space and confronted by a matching depression in the opposite or inner wall forming a detour from the otherwise circular space of the cam-follower track permitting an inward horizontal diversion from the otherwise circular travel of the cam-follower wheels, each wheel supported in a horizontal position and propelled by a rigid linkage of rods which are attached to the inner end of a slidable bar supported in apertured supports which are attached to a radial arm of the windmill, the cam-follower wheel, the rod linkage and the slidable bar constituting the linkage to a hinged upwardly pivotal blade-stop latch at the bar's outer end removable from its engagement with the power blade by being withdrawn horizontally as a result of the cam-follower being deflected from its circular course as it passes the cam in the cam assembly and pulling said linkage inwardly, all said assemblies in conjunction one with the others in duplicate at the top and bottom of the blade space, the linkage assemblies propelled by the radial arms as the windmill rotates, an alternative disengagement of the latches from the power blades is initiated by an upward lift of the outer end of the latches clearing inward extensions of the upper and lower framing bars of each of the power blades, said latches movable upwardly in elongated slots in apertured supports attached to the radial arms, said latches lifted by flexible linkages with the movable iron cores of a pair of electric solenoids mounted on the radial arms, both the top and bottom solenoids of the pair energized simultaneously by parallel circuitry as an automatic consequence of malfunction of the horizontal sliding of either the top or bottom linkage assembly, the solenoids' links lifts the outer end of the latches above their engagement with the power blades, the accuracy of either technique for feathering the blades at a predetermined point in the power angle of the blade travel is regulated by the proper adjustment of the relationship of the cam assemblies to the large wind trailing vane or rudder positioning the cams in relation to the wind direction, said rudder clamped to the sleeves of said cam assemblies to swivel on their support collars to effect a constant cam-to-wind relationship and the circuit electrodes attached to the side of the cam assembly bodies adjusted to make timely synchronized contacts in the solenoid circuit to conductor-plates mounted upon the top side of the first lateral rod of the top and bottom linkage assemblies to operate a current connection a moment later than the point in time when the cam action is initiated, provided of course that the conductor-plate-part of the electrode-contact on either the top or bottom linkage rods has not become normally withdrawn by the cams' action before said electrical contact is made.

4,203,708

ELASTOMERIC ROTOR LOAD REACTION SYSTEM

Robert C. Rybicki, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 26, 1978, Ser. No. 919,358
Int. Cl.[2] B64C *11/06, 27/38*
U.S. Cl. 416—134 A **6 Claims**



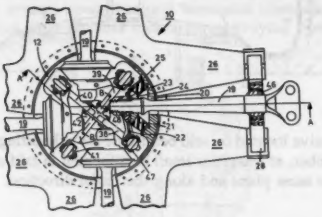
1. A helicopter rotor comprising:
(1) a hub mounted for rotation about an axis of rotation,
(2) at least one blade projecting radially from said hub,
(3) an elastomeric bearing supporting said blade from said hub for universal motion thereabout and so that rotation of the blade with said hub generates centrifugal force which causes a radially outward motion of the blade to exert a compressive load upon the elastomeric bearing,
(4) a lead-lag damper comprising a cylinder-piston mechanism extending substantially parallel to said blade and connected at its opposite ends to said blade and said hub to resist lead-lag motion of said blade,
(5) brake means operatively associated with said hub to reduce the speed thereof and hence cause said blade to lead and thereby cause said damper to impose a force on the blade to cause a radial inward motion of the blade to exert a tension load on said bearing in opposition to said compression load,
(6) and restraint means operative in response to centrifugal force from a first position wherein universal motion between said blade and said hub is permitted during flight operation and to a second position at a selected rotor rpm to prevent further inward motion of the blade when the bearing compressive load and the bearing tension load are substantially equal to thereby prevent the imposition of tension load on the bearing beyond a selected limit.

4,203,709

HELICOPTER ROTOR AND BLADE CONNECTION

Kenneth Watson, Yeovil, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed Sep. 7, 1978, Ser. No. 940,263
Claims priority, application United Kingdom, Sep. 7, 1977, 37426/77
Int. Cl.[2] B64C 27/38
U.S. Cl. 416—134 A 16 Claims



1. A helicopter rotor including a rotor hub arranged for rotation about an axis and a plurality of rotor blades extending radially of that axis, each blade being attached to the outer end of an individual spindle having its inner end so supported in a spindle-support bearing attached to structure of the rotor hub as to permit rotational movement of the spindle about its axis to change the pitch of its associated blade and to transmit centrifugal forces to the hub structure, means for rotating said spindle about its axis, a generally flat arm assembly associated with each said spindle, each arm assembly being flexible in a plane perpendicular to the plane of rotation and extending outwardly from said rotor hub to outer end parts spaced-apart from each side of said associated spindle in the plane of rotation of said spindle, and bearing means adjacent the outer end of each spindle and supported by both of said spaced-apart outer end parts of said arm assembly through resilient means arranged to permit movement of the spindle and its associated rotor blade relative the arm assembly in the plane of rotation of the spindle.

4,203,710

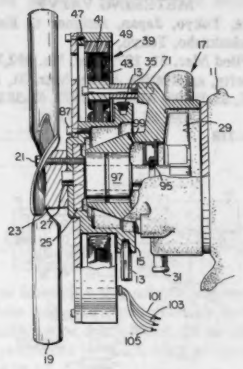
UNIFIED PUMP AND GENERATOR ARRANGEMENT

James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation-in-part of Ser. No. 734,116, Oct. 20, 1976, Pat. No. 4,095,922. This application Apr. 27, 1978, Ser. No. 900,531
Int. Cl.[2] F04B 21/00
U.S. Cl. 417—53 19 Claims

1. The method of assembling a pump and alternator with an engine comprising the steps of:
affixing the pump to the engine;
affixing the alternator stator to the pump;
passing a pump drive pulley through the stator and attaching the pulley to the pump actuating shaft; and
supporting an alternator rotor for rotation with the pulley with a portion of the rotor spanning the stator and with the pulley intermediate the stator and pump.

6. A unified pump-generator for a vehicle engine comprising:
a pump including a housing having a face, pump bearings supported in the housing and a rotatable driving shaft journaled in the pump bearings and axially extending from said housing face;
a rotatable hub member supported on said shaft for rotation about said shaft;
a generator stator mounted on and supported solely by said housing face;
a generator rotor fixedly secured to said hub member, the hub member and generator rotor rotatably supported by the pump bearings, said rotor positioned radially outward of the stator and concentric with said shaft;



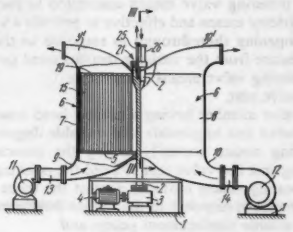
said hub member including a pulley for driving the pump shaft and generator rotor, the pulley being disposed axially intermediate the pump housing and the generator stator.

4,203,711

THERMAL ABSORPTION COMPRESSOR

Anatoly N. Podgorny, ulitsa Sumskaya, 118, kv. 14, Kharkov; Ilya L. Varshavsky, Leninsky prospekt, 66, kv. 141, Moscow; Viktor V. Solovei, prospekt Lenina, 41a, kv. 4, and Elena V. Sinegubova, ulitsa Bljukhera, 45, kv. 183, both of Kharkov, all of U.S.S.R.

Filed Apr. 19, 1978, Ser. No. 898,425
Int. Cl.[2] F04B 37/02, 37/04
U.S. Cl. 417—207 7 Claims

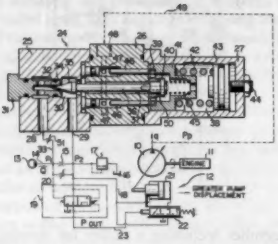


1. A thermal absorption compressor comprising:
a rotatable base plate;
generator-sorbers, each having a vessel filled with a solid sorbent and mounted on said rotatable base plate;
manifolds with pipes, grouping said generator-sorbers into sections;
a heat source for delivering a heat carrier onto the surface of said generator-sorbers;
a source of a coolant disposed substantially diametrically opposite to said heater source relative to said rotatable base plate for delivering said coolant onto the surface of the vessels of said generator-sorbers;
a gas distributing mechanism including a tap valve having a suction inlet, and a pressure outlet, and adapted to connect alternatingly said pipes of said manifolds to the suction inlet and to the pressure outlet as a result of the rotational movement of said base plate to enable continuous suction of the gas at a low pressure and delivery of the desorbed gas with constant parameters.

4,203,712
SINGLE OR PLURAL VARIABLE DISPLACEMENT PUMP CONTROL WITH AN IMPROVED FLOW METERING VALVE

Kazuo Uehara, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,305
Claims priority, application Japan, Mar. 31, 1977, 52-35397; Mar. 31, 1977, 52-35398; Mar. 31, 1977, 52-35399
Int. Cl.[2] F04B 49/00
U.S. Cl. 417—218 6 Claims



1. A hydraulic control system for a variable displacement hydraulic pump driven by a prime mover, comprising in combination:

a fixed displacement hydraulic pump;

restrictor means communicating with the fixed displacement pump and effective to create a differential in the output fluid pressure therefrom;

sensing valve means for sensing the pressure differential created by the restrictor means and for providing an output fluid pressure corresponding thereto;

servo control means communicating with the restrictor means and with the sensing valve means for adjusting the displacement of the variable displacement pump in response to the fluid pressure therefrom; and

flow metering valve means connected in parallel with the restrictor means and effective to provide a variable degree of opening therethrough in response to the output fluid pressure from the variable displacement pump, said flow metering valve means comprising:

a valve seat;

a valve member having a conical head coacting with the valve seat to provide said variable degree of opening;

spring means normally urging the conical valve head against the valve seat to hold the opening closed;

actuating means movable against the force of the spring means in response to the output fluid pressure from the variable displacement pump; and

means for operatively connecting the actuating means to the valve member when the former is moved to a predetermined degree against the force of the spring means;

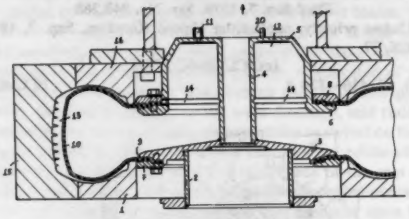
whereby the conical valve head moves away from the valve seat when the actuating means is moved to more than the predetermined degree against the force of the spring means.

4,203,713
TIRE RETREADING AUTOMATIC PRESS

Vincenzo Napolitano, Via delle Rose, 6, 20065 Inzago (Milano), Italy

Filed Jan. 15, 1979, Ser. No. 3,521
Claims priority, application Italy, Feb. 3, 1978, 19960 A/78
Int. Cl.[2] B29H 5/04
U.S. Cl. 425—23 4 Claims

1. An automatic press for tire retreading, which comprises a fixed mold base formed by a plurality of movable radial sectors, a vertical frame substantially shaped as a double bell joined to said fixed mold, said vertical frame having a radial opening; a band fixed along the edges of said frame at the perimetrical borders of said band, said band acting as an open air tube; said air tube being inflated through the air space defined by said bell frame and forming an air chamber, a valve at the top of the same bell frame for inflating said air tube; a

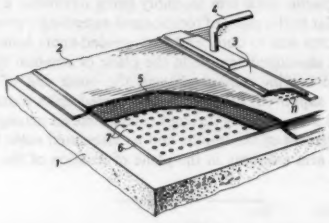


suction valve located on said bell frame for exhausting air from said chamber, at least four small bars located in said air chamber in the same plane and along the radial direction.

4,203,714
APPARATUS FOR VACUUM PROCESSING OF CONCRETE

Harald S. Wenander, Nacka, Sweden, assignor to Tremix AB, Skarholmen, Sweden

Filed May 24, 1976, Ser. No. 689,413
Claims priority, application Sweden, May 30, 1975, 7562224
Int. Cl.[2] B28B 11/00
U.S. Cl. 425—85 4 Claims



1. An apparatus for vacuum processing concrete to remove surplus water from a concrete surface comprising: an upper cover for sealingly defining a surface to be processed, a vacuum source, means for connecting said vacuum source to said cover, lower sheet means preventing solid particles from being sucked away from the concrete surface along with the water, and means forming passages between the upper cover and said lower sheet means for distribution of the vacuum from said vacuum source and transport of the water removed from the concrete, said lower sheet means having perforations comprising small holes the size of which substantially exceeds the smallest size of the particles of concrete.

4,203,715
ROTATING JOINT FOR EXTRUSION DIE

Garland E. Raley; C. W. Miller, and D. L. Smith, all of Terre Haute, Ind., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 24, 1978, Ser. No. 889,830
Int. Cl.[2] B29F 3/04
U.S. Cl. 425—131.1 9 Claims

1. A rotating joint assembly for feeding an extrusion die with two or more thermoplastic streams of a consistent uniformity of distribution comprising:

a. a stationary vertical manifold means for receiving two or more of said thermoplastic streams and conveying said streams upwardly to a series of generally toroidal dis-

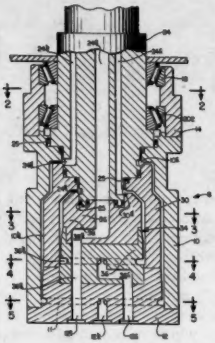
charge means in said manifold means, said manifold means having:

i. vertical cavity means therein for conveying said thermoplastic streams upwardly to said toroidal discharge means, the number of said cavity means being one less than the total number of thermoplastic streams fed to said extrusion die;

ii. a plurality of horizontal channels for conveying said thermoplastic stream horizontally and outwardly to said cavity means;

iii. vertical channel means for conveying said thermoplastic streams upward to said horizontal channels;

iv. first axial channel means for conveying one of said



thermoplastic streams upwardly to a central discharge opening in the center of said stationary manifold means; and,

b. a cylindrical conduit means rotatably connected to said manifold means, said conduit means having:

i. a plurality of generally toroidal intake means aligned with each of said generally toroidal discharge means for receiving and conveying said thermoplastic streams from said manifold means through vertical channel means in said cylindrical conduit means to an extrusion die;

ii. second axial channel means aligned with said central discharge opening for receiving and conveying one of said thermoplastic streams to said die.

4,203,716

PHOTOGRAPHIC ELEMENTS HAVING HYDROPHILIC COLLOID LAYERS CONTAINING HYDROPHOBIC ADDENDA UNIFORMLY LOADED IN LATEX POLYMER PARTICLES

Tsang J. Chen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 778,184, Mar. 16, 1977, abandoned, and Ser. No. 880,684, Feb. 23, 1978, abandoned, which is a continuation of Ser. No. 744,680, Nov. 24, 1976, abandoned, and Ser. No. 778,182, Mar. 16, 1977, abandoned, each is a continuation-in-part of Ser. No. 653,816, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 575,680, May 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 506,919, Sep. 17, 1974, abandoned, said Ser. No. 778,184, is a continuation-in-part of Ser. No. 744,842, Nov. 24, 1976, abandoned, and said Ser. No. 653,816. This application Aug. 23, 1978, Ser. No. 936,155

Int. Cl.[2] G03C *1/40, 1/84*

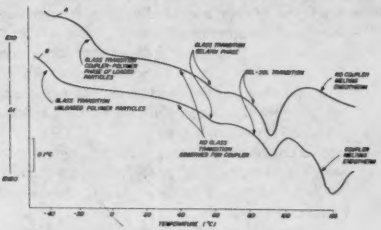
U.S. Cl. 430—207 **54 Claims**

1. In a photographic element comprised of

a support and, coated on the support,

one or more hydrophilic colloid layers, at least one of which is a silver halide emulsion layer,

the improvement in which at least one of the hydrophilic colloid layers contains in a photographically useful amount loaded polymer particles of from 0.02 to 0.2 micron in average diameter consisting essentially of a loadable polymer, with greater than 2 percent by weight the polymer being derived from monomers



capable of forming water soluble homopolymers, and, loaded into and distributed through said particles, a hydrophobic redox dye-releaser, the weight ratio of the redox dye-releaser to said loaded polymer being from about 1:4 to 3:1.

4,203,717

FLAT FLAME BURNER ASSEMBLY

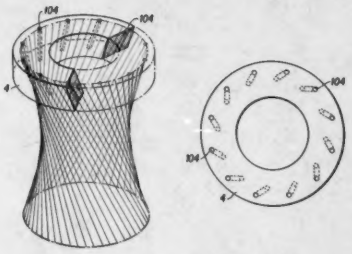
Giuseppe Facco, and Tomaso Carpaneto, both of Genoa, Italy, assignors to Italimpliant Societa Italiana Impianti per Asioni, Genoa, Italy

Filed Jan. 6, 1978, Ser. No. 867,226

Claims priority, application Italy, Jan. 14, 1977, 12418 A/77

Int. Cl.[2] F23M *9/00*

U.S. Cl. 431—182 **3 Claims**



1. A flat flame burner assembly for use in furnaces, comprising:

(a) a refractory block having a flaring port which defines a central axis and a combustion zone;

(b) a hollow body mounted externally of the furnace on the said flaring port, provided with an inlet opening for the admission of combustion air and presenting an air diffuser member having passages directed in such a manner as to cause the combustion air to swirl around said central axis in the combustion zone of the flaring port;

(c) a burner mechanism comprising a lance for feeding the fuel terminating with a burner head extending into the combustion zone, said lance being coaxial to the said central axis of the port; a first pipe for a fluid atomizing agent under pressure, arranged externally and coaxially to said lance; a cylindrical sheath which surrounds the said burner head in the combustion chamber, said sheath being in communication with the said first pipe, whereby a portion of fluid atomizing agent is used to provide a fluid protection for the burner head from the heat, said lance carrying the burner head, said first pipe for the fluid atomizing agent and said protective sheath surrounding the burner head being movable in an axial direction towards

and away from the combustion zone of the flaring port; a second pipe, mounted externally and coaxially to the said first pipe and terminating with an annular opening in correspondence of the diffuser member, for feeding a gaseous fuel into the combustion zone of the flaring port around the sheath surrounding the burner head, said burner head comprising:

a first chamber presenting a distributor for admitting the fuel and a first row of peripheral bores for admitting into said chamber the fluid atomizing agent, said bores being directed so as to confer a swirling motion to the said fluid atomizing agent;

a second chamber, or mixing chamber, in communication with the first chamber, provided with a second row of bores for admitting into said mixing chamber the fluid atomizing agent;

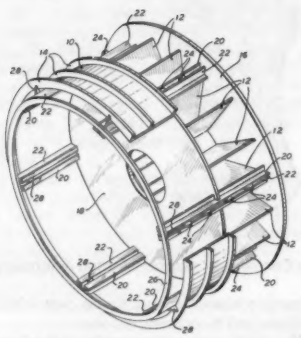
an outlet nozzle at the end of the mixing chamber, provided with an associated cup-like member held axially aligned opposite to said nozzle with its cavity directed towards the nozzle and at a predetermined distance therefrom.

4,203,718

REGISTER

James L. Tracy, Rexville, N.Y., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jun. 29, 1978, Ser. No. 920,520
Int. Cl.[2] F23M *9/00*
U.S. Cl. 431—188 7 Claims



1. A register for regulating the flow of air toward an inner combustion region comprising:

a first annular member;

a second annular member spaced alongside said first annular member;

a plurality of spaced vanes affixed between said first and second annular members, said plurality of spaced vanes being inwardly directed;

a plurality of spaced outer guide means mounted across said first and second annular members, said plurality of spaced outer guide means being peripherally disposed around said plurality of spaced vanes; and

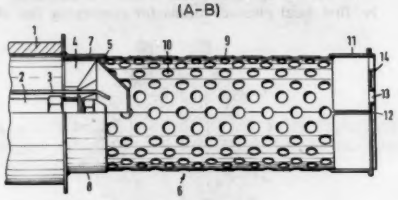
a sleeve encircling and bearing upon said plurality of spaced outer guide means, said sleeve being linearly movable to enshroud said vanes a variable amount, whereby the flow of air past said plurality of spaced vanes is regulated by moving said sleeve.

4,203,719

OIL BURNER ARRANGEMENT FOR HEATING INSTALLATIONS

Cary Brandt, Holderlinstrasse 11, 1 Berlin 19, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 879,877
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712856
Int. Cl.[2] F23D *15/02;* F23Q *3/00;* B05B *1/14*
U.S. Cl. 431—352 10 Claims



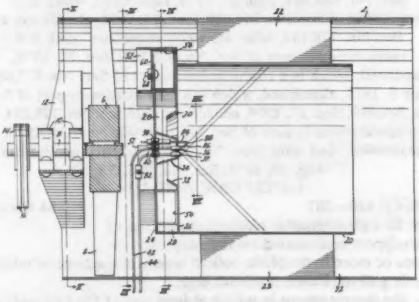
1. An oil burner arrangement for heating installations which generates a blue flame and which serves for the achievement of a soot-free, stoichiometric combustion, which oil burner arrangement comprises a burner housing, which burner housing serves for the addition of combustion air; a nozzle which is located coaxially in the burner housing, said nozzle serving to atomize oil; means for communicating oil to said nozzle; an evaporator tube which is located adjacent to the burner housing and located coaxially with reference to the burner housing, said evaporator tube extending into the burner space, said evaporator tube having at its circumference a plurality of drilled holes, which drilled holes serve for the addition of air from the burner space; a disk-shaped baffle, said evaporator tube being equipped with said disk-shaped baffle, said disk-shaped baffle being located at a selected distance with respect to the opened end of the evaporator tube cross pieces for mounting said baffle to said tube open end; said disk-shaped baffle being directed perpendicular to the axis of the evaporator tube, said disk-shaped baffle being equipped with outward flanged holes, and whereby the outward flanged holes holes serve for the stable combustion of the oil and air mixture which emerges from the evaporator tube.

4,203,720

OIL BURNER

Robert C. Chaffee, Green, and Ernest G. Bauer, Clay Center, both of Kans., assignors to Gilmore & Tatge Mfg. Co., Clay Center, Kans.

Filed Mar. 31, 1978, Ser. No. 892,286
Int. Cl.[2] F24H *3/02*
U.S. Cl. 432—222 6 Claims



1. An oil burner comprising:

a. an elongated combustion chamber open at its forward end,

b. a nozzle mounted at the rearward end of said combustion chamber and operable to spray oil longitudinally forwardly in said chamber,

c. means operable to ignite said oil initially, and

d. air delivery means operable to direct combustion air into the rearward end of said combustion chamber in a whirling pattern generally coaxial with said nozzle, whereby the air-oil mixture tends to be retained in the rearward portion of said combustion chamber and a hot fireball of flame develops therein, said fireball serving reliably to ignite oil subsequently ejected from said nozzle to render continuous ignition unnecessary, said air delivery means comprising a circular air chest disposed at the rearward end of said combustion chamber coaxially therewith, said chest having a forward wall dividing it from said combustion chamber and having a circular aperture of lesser diameter formed centrally therein coaxial with said combustion chamber, and a rearward wall, said nozzle being mounted in said rearward wall and projecting forwardly through said aperture, and blower means operable to deliver air tangentially into said air chest.

4,203,721

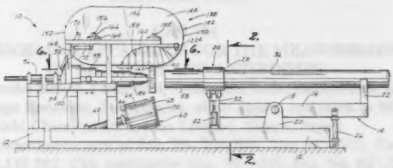
METHOD OF HEATING PLASTIC PIPE

Fay A. Hayes, 242 NW. 12th Ave., Boca Raton, Fla. 33432, and Leonard L. Hayes, 1906 10th Ave., Lewiston, Id. 83501

Division of Ser. No. 902,443, May 3, 1978. This application Mar. 19, 1979, Ser. No. 21,586

Int. Cl.[2] F27D *5/00*

U.S. Cl. 432—10 **5 Claims**



1. A method of heating one end portion of a plastic pipe comprising:

providing a heating bell having a generally continuous sidewall and an open end for receiving said pipe end portion therethrough,

advancing one of said pipe and heating bell toward the other whereby said pipe end portion is axially inserted through said open end and received within said sidewall,

directing a flow of heating fluid over the inserted pipe end portion, and

withdrawing said one of said pipe and heating bell away from the other for removal of the heated pipe end portion from the heating bell,

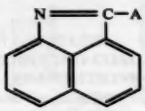
said withdrawing step including removing said pipe end portion from said heating bell in selected intermittent steps for step heating of said pipe end portion.

4,203,722
TRANSFER PRINTING PROCESS WITH NAPHTHOLACTAM DYES

Alfred Brack, Odenthal, and Hans-Peter Kühlthau, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

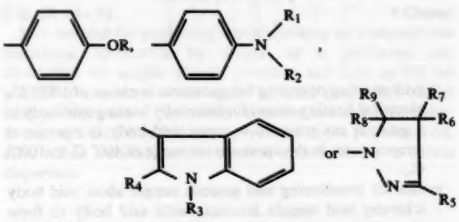
Filed Oct. 18, 1978, Ser. No. 952,560
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1977, 2747110
Int. Cl.² D06P *3/70, 5/00*
U.S. Cl. 8—467 **10 Claims**

1. Process for dyeing, by transfer printing, materials made of polyacrylonitrile or acid-modified polyesters, characterised in that dyestuffs of the formula



wherein

A represents a radical of the formula



wherein

R denotes a lower alkyl radical with at most 6 C atoms,

R_1 denotes hydrogen or a lower alkyl radical with at most 6 C atoms,

R_2 represents a lower alkyl radical with at most 4 C atoms,

R_3 represents hydrogen or a lower alkyl radical with at most 4 C atoms,

R_4 represents hydrogen or methyl,

R_5 represents a phenyl radical which can be substituted by lower alkyl or alkoxy groups with at most 4 C atoms, or represents an α-thienyl radical and

R_6, R_7, R_8 and R_9 represent hydrogen or a lower alkyl radical with at most 4 C atoms or a phenyl radical, with the proviso that only one of the radicals R_6, R_7, R_8 and R_9 is an optionally substituted phenyl radical,

and wherein

the radical R_1 or R_2 can also be bonded to the phenyl radical in the position adjacent to the nitrogen, a tetrahydroquinoline ring or an indoline ring being formed,

and wherein the cyclic and acyclic radicals can contain nonionic substituents, are used.

4,203,723
VITRA-VIOLET PROCESS FOR PRODUCING FLAME RESISTANT POLYAMIDES AND PRODUCTS PRODUCED THEREBY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Madeline S. Toy, Palo Alto, and Roger S. Stringham, Woodside, both of Calif.

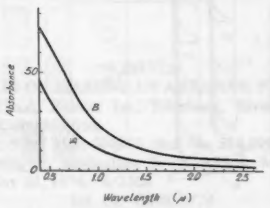
Filed Dec. 6, 1976, Ser. No. 747,674
Int. Cl.² C08F *8/00*
U.S. Cl. 8—115.5 **7 Claims**

1. A one step method to chemically modify aromatic polyamide fibrous products formed of poly-m-phenyleneisophthalamide to improve flame resistance properties and appearance of the aromatic polyamide fibrous product consisting essentially of contacting the aromatic polyamide substrate in a chamber with a gaseous medium containing haloolefinic material consisting of a mixture of tetrafluoroethylene and bromotrifluoroethylene and an inert diluent while irradiating said aromatic polyamide with ultraviolet light having sufficient energy to effect chemical bonding of said haloolefinic material to said aromatic polyamide.

4,203,724
METHOD AND APPARATUS FOR THE MEASUREMENT OF ANTIGENS AND ANTIBODIES

Masanobu Sawai, Yamatoshi; Tadamitsu Sudo, Sagamihara, and Shogo Enomoto, Tokorozawa, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 825,160, Aug. 16, 1977, Pat. No. 4,118,192. This application Jun. 20, 1978, Ser. No. 917,259
Claims priority, application Japan, Aug. 16, 1976, 51/97158; Feb. 14, 1978, 53/15018
The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.
Int. Cl.² G01N *21/24, 33/16*
U.S. Cl. 23—230 B **27 Claims**



1. An absorbance method of measuring antigens and antibodies comprising reacting an antigen or antibody or a mixture thereof with the corresponding antibody or antigen or mixture thereof, which has been supported on insoluble carrier particles having an average diameter of not greater than 1.6 microns to sensitize the carrier particles, said reaction being carried out in a liquid medium and the concentration of said carrier particles in the resulting mixture being 0.05 to 1% by weight; irradiating the reaction mixture with light which contains rays of polychromatic light having a particular wavelength region in the range of 0.6 to 2.4 microns and so selected that, when applied to the reaction mixture, it gives an increase in absorbance or percent absorption with time; and measuring the absorbance or percent absorption of the reaction mixture for the polychromatic light.

4,203,725
METHOD AND TEST KIT FOR THE ON-SITE DETERMINATION OF THE PRESENCE OF CONTAMINANT MATERIAL IN LUBRICATING OIL

James E. Snowden, Jr., and Esther A. Snowden, both of Houston, Tex., assignors to Contamoil Corporation, Santa Monica, Calif.

Filed Feb. 13, 1978, Ser. No. 877,371
Int. Cl.² G01N *31/22, 33/28*
U.S. Cl. 23—230 HC **12 Claims**

1. A lubricating oil analysis kit to analyze for a metallic contaminant that may be present in lubricating oil comprising:

at least one receptacle adapted to be opened and closed on one end thereof and containing therein an aqueous solvent and a reagent both present in predetermined concentration, said aqueous solvent effective to dissolve the preselected contaminant existing within the oil but not effective to dissolve the oil so as to form an oil phase and an aque-

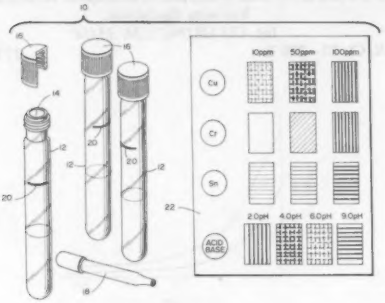
ous phase containing the dissolved preselected contaminant and said reagent capable of reacting with the dissolved contaminant and thereby causing a color to be generated in the aqueous phase;

a dispensing device adapted to dispense a volume of lubricating oil into said receptacle, the capacity of said receptacle being at least equal to the sum of the volumes of said oil phase and said aqueous phase;

a color intensity chart adapted for use in comparing color intensities generated when said aqueous solvent and said reagent are mixed with lubricating oil to determine the concentration of the preselected contaminant which may be existing within said oil.

7. An on-site method for determining the need for replacement of oil due to the build up of metallic contaminant material therein, which comprises the steps of:

removing a sample of oil, the oil being suspected of having a build up of metallic corrosive material therein, to provide a sample of oil;



vigorously mixing a known volume of said sample of oil in a known volume of an aqueous solvent which extracts metal and/or metal oxides existing within the oil from the oil into the aqueous solvent to form an aqueous phase comprising an aqueous solvent solution of said metallic contaminant material, said aqueous solvent solution including a reagent capable of reacting with the metal and/or metal oxide in the aqueous phase to generate a color in the aqueous phase indicative of the presence and concentration of said metallic contaminant, said aqueous solvent not being effective to dissolve the oil whereby distinct oil and aqueous phases are intimately mixed together;

allowing the oil phase to separate from the aqueous phase; and

comparing the color as generated in the aqueous phase by the reaction of said reagent with said metal and/or metal oxide to a standard color to determine the concentration of said metallic contaminant material.

4,203,726

THERMIONIC DETECTOR

Paul L. Patterson, Walnut Creek, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 28, 1978, Ser. No. 882,033
Int. Cl.[2] G01N *27/62*
U.S. Cl. 23—232 E **54 Claims**

1. A mehod for analyzing a sample to detect the presence of a component of said sample, said method comprising the steps of:

(a) electrically heating in a gaseous environment and to operating temperatures within the approximate range 400° C. to 1000° C. a solid body comprising a hardened ceramic cement impregnated with an alkali metal, and capable of withstanding operating temperatures in excess of 1000° C.;

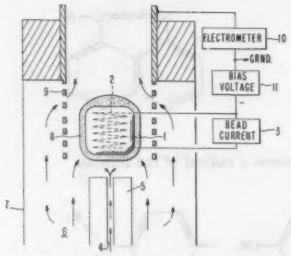
(b) causing said sample to interact with said heated body to form negative ions,

(c) maintaining a difference of electrical potential between said surface of said body and a collector electrode to cause a current of said negative ions to move towards said collector electrode, and

(d) measuring said negative ion current to detect the presence of said specific component of said sample.

20. An apparatus for the analysis of a sample in a gaseous state to detect the presence of a specific component of said sample, said apparatus comprising:

a solid body comprising a hardened ceramic cement impregnated with an alkali metal, said solid body being capable of



withstanding operating temperatures in excess of 1000° C., electrical heating means for internally heating said body in a gaseous environment to cause said body to operate at temperatures in the approximate range of 400° C. to 1000° C.,

means for transferring said gaseous sample about said body whereby said sample interacts with said body to form negative ions in response to the presence of said specific component in said gas,

means for causing a current of said negative ions to move toward a collector electrode,

and means for measuring said negative ion current, whereby said specific component is detected.

4,203,727

PROCESS FOR REDUCING THE SULFUR CONTENT OF COAL

Charles H. Simpson, 7749 E. Chaparral Rd., Scottsdale, Ariz. 85253

Filed Nov. 29, 1978, Ser. No. 964,742
Int. Cl.[2] C10L *9/10*; C01B *17/14*
U.S. Cl. 44—1 SR **2 Claims**

1. A process for reducing the sulfur content of raw coal containing sulfur impurities and water, comprising the steps in sequence of:

(a) comminuting said raw coal in a vapor-tight extraction zone in contact with a combustible solvent for sulfur at an elevated temperature to form sulfurous acid in situ and continuing said contact to form an extraction mixture slurry, including

(i) a liquid component comprising said solvent containing sulfur impurities from said raw coal dissolved therein, and

(ii) a solid component comprising said comminuted, extracted coal;

(b) separating said liquid and solid components of said extraction mixture slurry.

4,203,728

FUEL COMPOSITION COMPRISING A COAL-OIL SLURRY

Richard V. Norton, Wilmington, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Feb. 28, 1977, Ser. No. 772,416
Int. Cl.[2] C10L 1/32
U.S. Cl. 44—51 4 Claims

1. A process for preparing a slurry comprising oil and comminuted coal for transport through pipelines and use as fuel wherein the suspension stability of said coal particles in the oil is increased which comprises oxidizing the surface of said coal particles and then slurrying said coal in said oil.

4,203,729

METHOD FOR PRODUCING COAL DISPERSING OIL COMPOSITIONS

Takaharu Ishizaki; Taizo Igarashi, and Hirozumi Shimizu, all of Amagasaki, Japan, assignors to Nippon Oil & Fats Co. Ltd., Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 919,048
Claims priority, application Japan, Jun. 30, 1977, 52-77166
Int. Cl.[2] C10L 1/32
U.S. Cl. 44—51 4 Claims

1. A method for producing coal dispersing oil compositions containing 10–89.99% by weight of a petroleum oil, 10–89.99% by weight of coal powders and 0.01 to 5% by weight of a surface active agent wherein previously milled coal powders and a petroleum oil are mixed and then dehydrated, or a coal is milled and dehydrated in the petroleum oil, after which a surface active agent is added thereto to obtain dispersion.

4,203,730

POLYAMINE DERIVATIVES OF OXIDIZED OLEFINIC SUBSTITUTED DICARBOXYLIC ACID COMPOUNDS

Joseph B. Hanson, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 14, 1978, Ser. No. 942,296
Int. Cl.[2] C10L 1/22
U.S. Cl. 44—71 16 Claims

1. A composition comprising the polyamine derivative of an oxidized substantially undegraded adduct of an olefinic compound and an unsaturated dicarboxylic acid compound having 4 to 10 carbon atoms containing two carboxyl functions either free or in an anhydride form and at least one unsaturated olefinic bond.

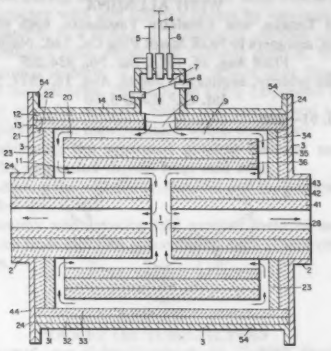
4,203,731

RADIANT ENERGY GASIFICATION APPARATUS

Wayne Bailey, R.D. #2, Schaghticoke, N.Y. 12154, and Robert Kemp, Box 96 Lansingburgh, Troy, N.Y. 12182

Continuation of Ser. No. 761,216, Jan. 21, 1977, abandoned. This application Dec. 15, 1977, Ser. No. 860,984
Int. Cl.[2] C10B 1/00
U.S. Cl. 48—99 4 Claims

1. A continuous high speed gas making retort having a substantially upright mixture chamber opening into a refractory cylinder inside of which there is another refractory cylinder each of which cylinders are substantially horizontal with means defining a circular space between each of said refractory cylinders and enclosing two centrally positioned refractory circular gas out take tubes directly opposite to each other with a gas making space between their two internal ends and with further means defining a circular space around each of said refractory gas out take tubes and means for introducing air, oil



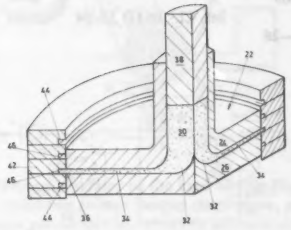
(or pulverized carbon fuel) and finely divided water into said gas making retort, via said upright mixing chamber.

4,203,732

METHOD OF MAKING AN ABRASIVE PRODUCT

Cornelius Phaal, Robant La., Edenburg, Rivonia, Sandton, Transvaal, South Africa

Filed Mar. 3, 1975, Ser. No. 554,699
Claims priority, application South Africa, Mar. 7, 1974, 74/1477; May 24, 1974, 74/3328
Int. Cl.[2] C09K 3/14
U.S. Cl. 51—293 5 Claims

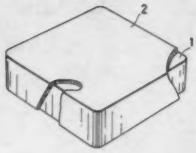


1. A method of making an abrasive product including the steps of preparing a mixture of needle-shaped abrasive particles each having a long and a short axis and starter ingredients for a bonding matrix, flowing said mixture along a passage thereby orienting the abrasive particles such that the long axis of the abrasive particles are placed substantially in the direction of the flow, causing the mixture to flow from the passage into a product-defining cavity, such that the flow into the cavity is substantially normal to the wall of the cavity defining the working face of the product so that the abrasive particles are oriented substantially normally to the working face of the product and at least partially setting the starter ingredients of the bonding matrix in the cavity wherein the ratio of the long axes to a short axes of said abrasive particles is greater than 3:1, wherein the bonding matrix is selected from the group consisting of resin, metal, vitreous and rubber and wherein the abrasive particles are selected from the group consisting of diamond particles, cubic boron nitride particles and mixtures thereof.

4,203,733
ALUMINUM NITRIDE SINTERED BODY COATED WITH ALUMINA

Hiroshi Tanaka, and Yoshihiro Yamamoto, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 16, 1978, Ser. No. 934,285
Claims priority, application Japan, Aug. 16, 1977, 52-97509
Int. Cl.[2] B24D 3/06
U.S. Cl. 51—295 8 Claims



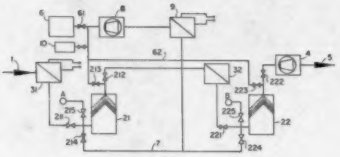
1. An aluminum nitride sintered body consisting essentially of a sintered body of aluminum nitride with alumina crystals having an average particle diameter of 2.5 microns or less on the surface of the sintered body.

5. A high-speed cutting tool comprising the aluminum nitride sintered body of claim 1.

4,203,734
METHOD AND APPARATUS FOR THE SELECTIVE ADSORPTION OF VAPOROUS OR GASEOUS IMPURITIES FROM OTHER GASES

Karl Winter, Dortmund-Sölde, and Günter Staschik, Halingen, both of Fed. Rep. of Germany, assignors to Ceagfilter und Entstaubungstechnik GmbH, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 738,537, Nov. 3, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,384
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1976, 2610963
Int. Cl.[2] B01D 53/04
U.S. Cl. 55—26 4 Claims



1. Method for the selective adsorption in adsorption filters of a mixture of vaporous impurities of different volatilities in a stream of exhaust air which comprises passing said stream of exhaust air containing said mixture of vaporous impurities of different volatilities through at least two adsorption filters connected in tandem with each filter containing activated carbon as the adsorption medium, maintaining the temperature of adsorption in the first activated carbon adsorption filter at a temperature sufficiently high to selectively adsorb the vaporous impurities of low volatility with passage of said stream of exhaust air containing vaporous impurities of higher volatility in direct contact with and through said first activated-carbon adsorption filter, and passing said stream of exhaust air containing vaporous impurities of higher volatility in direct contact with and through at least said second activated-carbon adsorption filter at a temperature lower than the temperature in the first activated-carbon adsorption filter to selectively adsorb said vaporous impurities of higher volatility, maintaining the temperature of adsorption to effect selective adsorption in each of said two adsorption filters by passing said stream in indirect heat exchange with a fluid at a different temperature prior to passing said stream into each of said two adsorption filters, individually desorbing each adsorption filter by passage of an inert gas through the filter after it has attained a predetermined loading of the vaporous impurities and discharging the inert gas containing desorbate as vaporous impurities separately from each individually desorbed adsorption filter the first of said two adsorption filters being desorbed at a longer time interval than the second, and recovering the desorbate containing the impurities of high volatility from the second adsorption filter separate and apart from the desorbate containing the impurities of low volatility from the first adsorption filter.

3. Apparatus for the selective adsorption in adsorption filters of a mixture of vaporous impurities of different volatilities in a stream of exhaust air comprising at least two adsorption filters connected in tandem with each filter containing activated carbon as the adsorption medium, means for maintaining the temperature of adsorption in the first activated carbon adsorption filter at a temperature sufficiently high to selectively adsorb the vaporous impurities of low volatility with passage of said stream containing vaporous impurities of higher volatility in direct contact with and through said first activated carbon adsorption filter, and means for maintaining the temperature of adsorption in said second activated carbon adsorption filter through which the exhaust air stream containing vaporous impurities then passes in direct contact, at a temperature lower than the temperature in the first activated carbon adsorption filter to selectively adsorb vaporous impurities of higher volatility, wherein said means for maintaining the temperature of adsorption in each of said two adsorption filters is a heat exchanger preceding each of said filters, through which said stream passes in indirect heat exchange with a fluid at a different temperature, and including means for generating an inert gas, and means for passing said inert gas individually to each adsorption filter to individually desorb the filter after it has attained a predetermined loading of the vaporous impurities with the first of said two adsorption filters being desorbed at a longer time interval than the second, and means for discharging the inert gas containing desorbate as vaporous impurities separately from each individual desorbed adsorption filter and recovering the desorbate of high volatility from the second adsorption filter separate and apart from the desorbate containing the impurities of low volatility from the first adsorption filter.

4,203,735
PROCESS FOR PURIFYING GASEOUS FORMALDEHYDE

Paolo Colombo, Saronno, and Pierino Radici, Turate, both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Apr. 12, 1978, Ser. No. 895,553
Claims priority, application Italy, Apr. 13, 1977, 22394 A/77
Int. Cl.[2] B01D 53/12
U.S. Cl. 55—26 16 Claims

1. A continuous process for purifying raw gaseous formaldehyde containing impurities comprising water, methyl alcohol, formic acid and mutual reaction products thereof, which comprises purifying said raw formaldehyde in an adsorption step by introducing a flow of said raw formaldehyde at the bottom of the lowermost bed of a first series of superimposed, spaced-apart, communicating fluidized beds of solid adsorbent, passing the flow of raw formaldehyde through said first series of fluidized beds and recovering purified formaldehyde at the top of the uppermost bed of said first series, maintaining the temperature within said first series of fluidized beds at a value of from 80° to 140° C., and continuously introducing solid adsorbent into the uppermost bed of said first series, passing said solid adsorbent from each bed to the following one of said first series and continuously discharging from the lowermost bed of said first series exhausted solid adsorbent containing adsorbed formaldehyde and impurities; selectively desorbing said adsorbed formaldehyde in a desorption step by stripping with an inert gas, thereby recovering substantially all adsorbed formal-

dehyde, by continuously introducing said exhausted solid adsorbent into the uppermost bed of a second series of superimposed, spaced-apart, communicating fluidized beds of solid adsorbent, passing said exhausted solid adsorbent from each bed to the following one of said second series and continuously discharging the exhausted solid adsorbent thus treated from the lowermost bed of said second series, introducing at the bottom of the lowermost bed of said second series a stream of inert gas to strip said adsorbed formaldehyde and maintain fludization conditions in said second series of fluidized beds, passing said stream of inert gas through the second series of fluidized beds and discharging from the top of the uppermost bed of said second series a stream of inert gas enriched in desorbed formaldehyde, and maintaining the temperature within said second series of fluidized beds at a value of from 130° to 150° C.; regenerating the exhausted solid adsorbent thus treated by stripping with an inert gas in a regeneration step by continuously introducing said exhausted solid adsorbent thus treated into the uppermost bed of a third series of superimposed, spaced-apart, communicating fluidized beds of solid adsorbent, passing said exhausted solid adsorbent thus treated from each bed to the following one of said third series and continuously discharging the thus regenerated solid adsorbent from the lower most bed of said third series, introducing at the bottom of the lowermost bed of said third series a stream of inert gas to strip said adsorbed impurities and maintain fluidization conditions in said third series of fluidized bed, passing said stream of inert gas through the third series of fluidized beds and discharging from the top of the uppermost bed of said third series a stream of inert gas enriched in desorbed impurities, and maintaining the temperature within said third series of fluidized beds at a value higher than that maintained in the second series and from 145° to 250° C.; and continuously recycling the solid adsorbent thus regenerated to the uppermost bed of said first series.

4,203,736

METHOD AND APPARATUS FOR PURIFYING A GAS OF SUSPENDED PARTICLES

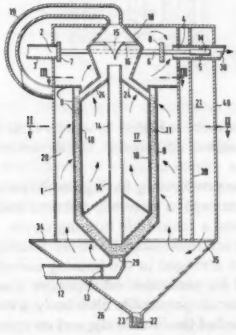
Wolfgang Berz, Westmount, Canada, assignor to Gimag Aktiengesellschaft, Chur, Switzerland

Continuation-in-part of Ser. No. 793,418, May 3, 1977, Pat. No. 4,142,873. This application Jan. 2, 1979, Ser. No. 545

Claims priority, application Switzerland, May 6, 1976, 5706/76

Int. Cl.² B01D *37/00, 46/30, 46/42*

U.S. Cl. 55—96 **12 Claims**



9. In a method of purifying a gas of suspended particles in which the gas to be purified is passed from a first space to a third space through a filter bed of granular material confined in a second space between perforated, vertically extending walls, whereby at least a portion of said particles is retained by said granular material, said second space having topmost and lowermost portions, and purified gas is withdrawn from said third space in each of a plurality of filtering phases, granular material carrying retained particles is withdrawn from said lowermost portion during each of a plurality of filter bed cleaning phases alternating with said filtering phases by suspending the granular material in a stream of conveying gaseous material flowing toward a zone above said topmost portion, the suspended granular material is separated in said zone from said stream and said particles, the particles being suspended in said stream, the granular material being returned to said second space by gravity, the improvement which comprises:

(a) withdrawing the separated gaseous material and the particles suspended therein from said zone,

(b) introducing the withdrawn material and the particles into said first space, and

(c) separately withdrawing said gaseous material and the particles from said first space during each of said cleaning phases.

4,203,737

POCKET OR TUBE FILTERS

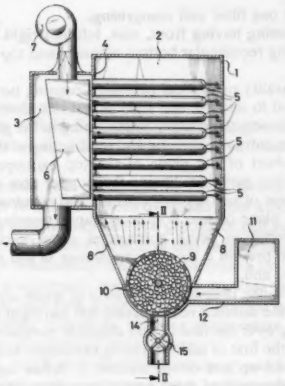
Adolf Margraf, Am Schleplingsbach 46, D-3060 Stadthagen Wendthagen, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,558

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743805

Int. Cl.² B01D *46/04, 46/42*

U.S. Cl. 55—287 **3 Claims**



1. In a filtering separator of the kind having filter elements and a dust collecting trough located therebelow, and wherein a smoke laden gas containing extremely adherent dust particles is fed into the dust collecting trough and upwardly toward the filter elements, and compressing filter cleaning means such that when the dust which settles when the filter surfaces are periodically cleaned is carried back together with the dust of the incoming smoke laden gas to the filter surfaces for agglomeration purposes, and a proportion of the agglomerated dust, corresponding to the amount of dust in the incoming smoke laden gas and which by its weight or size cannot be carried back to the filter surfaces by the smoke laden gas, being removed from said dust collecting trough; the improvement comprising a longitudinally extending rotatably mounted perforated drum having heavy bodies therein and occupying the lower portion of said dust collecting trough and positioned so that the smoke laden gas is directed into the trough and passes through said perforated drum, the upper portion of said drum being exposed for receiving the agglomerated dust loosened periodically from the filter elements and acting as a dust collecting store or reservoir, and further comprising an exit opening in the dust collecting trough below or at the end of said drum to allow dust collected in said perforated drum to drop out of said drum and to be removed from the collecting trough,

said separator further comprising means to rotate said drum in order to effect removal of the dust as soon as the resistance to flow through said drum reaches a maximum and which is adapted to be stopped when a minimum resistance is reached.

4,203,738

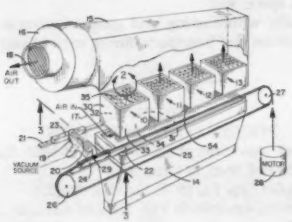
COMBINATION AIR FILTER AND VACUUM CLEANING SYSTEM

Kenneth C. Kerman, 1126 6th St., Santa Monica, Calif. 90403

Filed Nov. 13, 1978, Ser. No. 960,472

Int. Cl.[2] B01D *46/04*

U.S. Cl. 55—287 **6 Claims**



1. An air filter and vacuum cleaning system including, in combination:

(a) at least one filter unit comprising:

(1) a housing having front, rear, left and right side walls defining rectangular bottom entrance and top exit openings;

(2) a plurality of vertical partitions running between and secured to said left and right side walls, alternate partitions having their lower ends starting in the plane of the bottom entrance opening and terminating at their upper ends short of the plane of the top exit opening, the remaining partitions having their upper ends starting in the plane of said top exit opening and terminating short of the plane of said bottom entrance opening, each of said partitions being corrugated along vertical bend lines to present a zig-zag appearance in top plan cross section; and,

(3) a cloth-like fibrous filtering strip of width corresponding to the distance between said left and right side walls passing over the first of said alternate partitions, thence under the first of said remaining partitions, and continuing in an up and down manner to define upper folds about the ends of those partitions terminating short of the top exit opening and lower folds about the lower ends of those partitions terminating short of the bottom entrance opening, the portions of said strip between the upper and lower folds passing between the partitions being held in generally vertical parallel planes by said partitions, the corrugations defining with the strip a series of vertical channels of generally triangular cross section when viewed in plan, particulate and other impurities to be filtered from air entering said entrance opening accumulating in greatest concentrations in the form of slugs in the strip folds adjacent to the top exit opening; and

(4) a thin screen overlying said bottom entrance opeing; and

(b) a vacuum cleaning means for removing accumulated impurities from said at least one filter unit including:

(1) a pair of guide tracks running along parallel and adjacent to the lower ends of the left and right side walls of said filter unit housing;

(2) a vacuum head for connection to a vacuum source mounted for movement along said tracks to pass under said bottom entrance opening of said housing adjacent to said screen, said head having a vacuum slot extending between said left and right walls parallel to said folds, said slot being between ¼ and ½ the distance between said alternate partitions and having planar surfaces ahead and behind said slot in engagement with said screen extending in forward and rearward directions distances greater than said distance between alternate partitions; and

(3) means for moving said vacuum head along said bottom entrance opening between said front and rear walls of said filter unit housing so that said slot successively applies vacuum to the channels defined by the alternate corrugated partitions as it traverses the same, the channels and slots cooperating to create a confined air movement in the channels of sufficient velocity to carry said slugs from the strip folds adjacent to said exit opening along with other impurities down the channels communicating with the slot opening to remove the slugs, said impurities themselves acting as mechanical scrubbers in their movement along the sides of the channels to further clean the strip portions between the partitions

whereby said filter unit can be periodically cleaned by said vacuum system without mechanical shaking of the filters and without the necessity of disassembling the filter units.

4,203,739

SEPARATOR DEVICE FOR REMOVING OIL FROM AN AIR STREAM

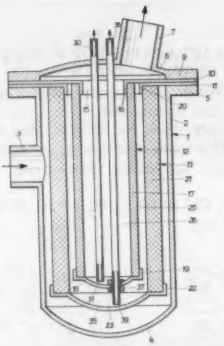
Hans Erdmannsdörfer, Ludwigsburg, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,245

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 7726666[U]

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—323 **4 Claims**



1. A separator device adapted to remove oil from an air stream carrying a mist of oil droplets, the device comprising in combination:

an enclosed separator housing having the shape of a pot with a vertical center axis, a generally vertical housing wall, a bottom end, and a removable housing cover;

a raw air intake arranged laterally in the housing wall;

a clean air outlet arranged in the housing cover;

first and second air permeable oil separator elements, each having a tubular air permeable filter body, a bottom cover at the lower end of the filter body, and an open cover disc at the upper end of the filter body which serves as a mounting member for the separator element, the two separator elements being mounted inside the housing in such a way that the first element surrounds the second element, so that the interior space of the housing is subdivided into a raw air space between the raw air intake duct and the first separator element, an intermediate air space between the two separator elements, and a clean air space

between the second separator element and the clean air outlet, thereby forcing the oil-carrying air stream to flow radially inwardly through the filter body of the first element, to traverse the intermediate air space, to flow radially inwardly through the filter body of the second element and to leave the latter through its open cover disc towards the housing cover and its clean air outlet;

a first oil collecting space at a low point of the intermediate air space, for the accumulation of oil droplets collected by the first separator element;

first conduit means leading from the first oil collecting space to the outside of the separator housing, for the removal of the accumulated oil from said space;

a second oil collecting space at the low point of the clean air space, for the accumulation of oil droplets collected by the second separator element; and

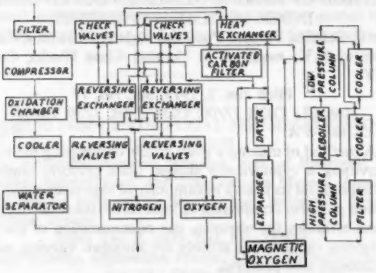
second conduit means leading from the second oil collecting space to the outside of the separator housing, for the removal of the accumulated oil from said space.

4,203,740

OXYGEN PRODUCTION BY PARAMAGNETIC REMOVAL OF MAGNETIZED OXYGEN FROM LIQUID AIR

V. A. Vaseen, 9840 W. 35th Ave., Wheat Ridge, Colo. 80033, assignor to Vesper Albert Vaseen, Wheat Ridge, Colo.

Filed Sep. 11, 1978, Ser. No. 940,905
Int. Cl.² F25J 3/00
U.S. Cl. 62—18 **1 Claim**



1. An improved method in the production of pure oxygen gas from liquefaction of air, consisting of the steps of;

passing a stream of liquid air through the gap between the north and south poles of a high intensity magnet,

having a magnetic force $10KO_e$ great enough to create paramagnetic forces on the dissolved oxygen atoms and molecules,

at a temperature of the liquid air between (−)182.96° C. and (−) 152.30° C.,

at a velocity and movement of liquid air and liquid nitrogen mass within the liquid air which permits migration of the dissolved gaseous oxygen to the magnet poles,

thus supersaturating the liquid nitrogen and liquid air with paramagnetic oxygen gas,

which form bubbles and effervesce from the liquid air mass, collecting the gaseous oxygen above the liquid air surface and removing oxygen to use or storage,

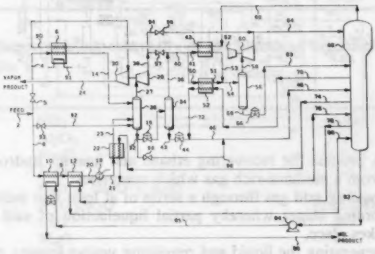
then disposing of remaining liquid air and liquid nitrogen by evaporation, using the cooling from heat absorption for cooling additional air.

4,203,741

SEPARATE FEED ENTRY TO SEPARATOR-CONTACTOR IN GAS SEPARATION

Robert M. Bellinger, and Michael L. Gray, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 14, 1978, Ser. No. 915,687
Int. Cl.² F25J 3/02
U.S. Cl. 62—24 **13 Claims**



1. A process comprising:

(a) dividing a fluid feed stream having higher and lower molecular weight hydrocarbons into at least first and second portions;

(b) passing said first portion of said feed stream into heat exchange relationship with overhead from a downstream stripping zone to cool said first portion of said feed stream;

(c) passing said second portion of said feed stream into heat exchange relationship with a stream from a lower portion of said downstream stripping zone to cool said second portion of said feed stream, said first portion of said feed stream being cooled to a lower temperature than said second portion of said feed stream;

(d) passing said thus cooled first portion of said feed stream to an upper portion of a separation and contacting zone;

(e) passing said thus cooled second portion of said feed stream to said separation and contacting zone at a point at least 20 percent of the height of said separation and contacting zone below the point of said cooled first portion of said feed stream;

(f) withdrawing a vapor stream from an upper portion of said separation and contacting zone and passing said vapor stream to an expansion zone where said vapor stream is expanded to cool said vapor stream and produce external work;

(g) withdrawing a cooled expanded fluid stream from said expansion zone and passing said thus cooled fluid stream to an upper portion of said stripping zone;

(h) withdrawing liquid from a lower portion of said separation and contacting zone;

(i) passing at least a major portion of the thus withdrawn liquid of (h) to said stripping zone at a point below the introduction of said cooled fluid stream of (g) and above the point said stream of (c) is withdrawn;

(j) withdrawing said overhead from said heat exchange with said first portion of said feed as a vapor product of the process; and

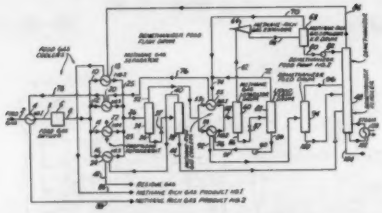
(k) withdrawing bottom product from said stripping zone as a liquid product of said process.

4,203,742

PROCESS FOR THE RECOVERY OF ETHANE AND HEAVIER HYDROCARBON COMPONENTS FROM METHANE-RICH GASES

Chaitanya B. Agnihotri, Cedar Knolls, N.J., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Oct. 31, 1978, Ser. No. 956,324
Int. Cl.[2] F25J 3/02
U.S. Cl. 62—24 18 Claims



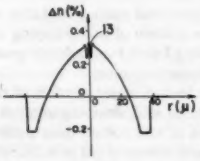
1. A process for recovering ethane and heavier hydrocarbons from a methane-rich gas which comprises:
(a) passing said gas through a series of at least two indirect cooling stages whereby partial liquefaction of said gas takes place,
(b) separating the liquid and remaining vapors leaving each indirect cooling stage,
(c) vaporizing a portion of each of the liquids so formed by passing said liquids through pressure reduction stages,
(d) separating the vapors from the liquids remaining,
(e) passing the vapor from the last cooling stage through an expansion turbine whereby part of said vapor is liquefied,
(f) separating said liquid and remaining vapor,
(g) passing the liquid remaining after the last liquid pressure reduction stage in heat exchanger relation with a portion of the already partly cooled feed vapor thereby vaporizing a portion of said liquid and forming therefrom a mixture of vapor and liquid, and
(h) passing said mixture of vapor and liquid, the liquid from the separator after the expansion turbine and the liquid from the separator following the first liquid pressure reduction stage as separate feed streams to a demethanizer tower, said tower operating at a pressure level intermediate the inlet feed gas pressure and the pressure at the outlet of the expansion turbine.

4,203,743

METHOD OF PRODUCING OPTICAL FIBER

Tsuneo Suganuma, Tokorozawa; Koji Ishida, Tokyo; Shin Satoh, Iruma; Mamoru Sugie, Hachioji; Toshio Katsuyama, Kokubunji, and Gyozo Toda, Hino, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 832,900, Sep. 13, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,672
Claims priority, application Japan, Sep. 20, 1976, 51-111864; Feb. 14, 1977, 52-14270
Int. Cl.[2] C03B 37/02
U.S. Cl. 65—3 A 20 Claims



1. A method of producing optical fiber, wherein a glass film is deposited by chemical vapor reaction on the inner wall surface of a glass tube, an optical preform is produced from said glass tube by heating and collapsing said glass tube, and an optical fiber is produced from said preform by heating and drawing said optical preform, comprising the steps of:
(i) depositing a glass film having a dopant therein, for enhancing the refractive index of said glass film, onto an inner wall surface of a glass tube by a chemical vapor reaction, said depositing taking place at a temperature up to 1100° C., whereby a glass film having a dopant therein and having a desired refractive index or refractive index profile is deposited on said inner wall surface;
(ii) heating the glass tube, having the glass film, with the dopant therein and with a desired refractive index or refractive index profile, on an inner wall surface of said tube, to a temperature between 1400°–1500° C., passing a gas through said tube, said gas consisting essentially of (a) a compound gas which can be oxidized, at said temperature between 1400°–1500° C., to form an oxide which enhances the refractive index of said glass film, and (b) an oxidizing gas, and forming and precipitating on said glass film a precipitate consisting essentially of said oxide which enhances the refractive index of said glass film, said forming and precipitating occurring during said passing said gas through said tube, whereby the deposited glass film having a dopant therein is densified and the evaporation of the dopant from said glass film while producing said optical preform by heating and collapsing said glass tube is suppressed and compensated for;
(iii) heating said glass tube to a temperature between 1550°–1650° C. and collapsing said tube at this temperature between 1550°–1650° C., whereby a solid optical perform is produced; and
(iv) heating and then drawing said solid optical preform to form said optical fiber.

4,203,744

METHOD OF MAKING NITROGEN-DOPED GRADED INDEX OPTICAL WAVEGUIDES

Peter C. Schultz, Painted Post, and Raja R. Wusirika, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 2, 1979, Ser. No. 77
Int. Cl.[2] C03B 37/00; C03C 3/08, 3/30, 13/00
U.S. Cl. 65—3 A 8 Claims

1. A method of making a glass article comprising the steps of
providing a cylindrically shaped glass preform containing throughout its mass a multiplicity of interconnected pores, said preform comprising at least two oxides having different affinities for nitrogen, the concentration of the oxide having the greatest affinity for nitrogen varying radially through said preform,
heating said porous preform in a nitrogen-containing atmosphere at a temperature sufficient to cause nitrogen to react therewith, and
heating said preform to a temperature sufficient to cause said preform to consolidate and form a dense glass article.

4,203,745

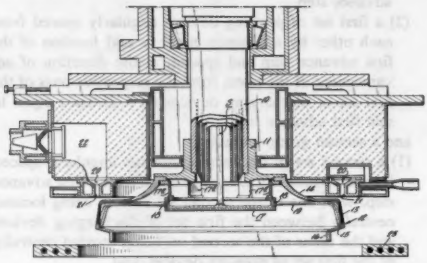
GLASS FIBERIZATION BY CENTRIFUGAL FEED OF GLASS INTO ATTENUATING BLAST

Jean A. Battigelli, and Francois Bouquet, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 6, 1979, Ser. No. 27,617
Claims priority, application France, Dec. 8, 1978, 78 34616
Int. Cl.[2] C03D 37/04
U.S. Cl. 65—6 20 Claims

1. Glass fiberizing equipment comprising a hollow spinner having a peripheral wall with a plurality of rows of orifices for centrifugal projection of streams of molten glass, having a glass distributing device within the spinner, and a blower generating an annular gas current directed downwardly around the spin-

ner, characterized in that the distributing device comprises means for feeding all of the glass to be fiberized to the region of the uppermost row of spinner orifices, with consequent laminar flow of the glass downwardly on the inside of the peripheral wall of the spinner in a substantially unobstructed layer overlying the rows of orifices, means for heating the lower edge portion of the peripheral wall of the spinner, sufficiently to maintain a glass temperature at the lower edge portion of the peripheral wall approximating the temperature of the glass at the upper edge portion of said peripheral wall, thereby establishing substantial uniformity in the viscosity of the glass in the upper and lower regions of the spinner wall,



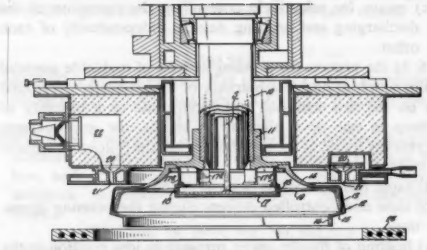
and the peripheral wall of the spinner being of progressively increasing thickness from the upper to the lower region thereof and the diameter of the spinner orifices and the thickness of the peripheral wall of the spinner in the upper and lower regions thereof being proportioned to establish resistance in the centrifugal delivery of the glass, at a given viscocity, which resistance is higher in the lower rows of orifices than in the upper rows of orifices, thereby providing greater extent of projection of the streams of molten glass from the upper rows of orifices than from the lower rows of orifices, notwithstanding the substantial uniformity of viscosity of the glass projected from the orifices in the upper and lower regions of the peripheral wall.

4,203,746

METHOD FOR CENTRIFUGAL FIBERIZATION OF HARD GLASS

Jean A. Battigelli; Francois Bouquet, both of Rantigny; Igor Fezenko, Aubervilliers, and Jean-Jacques Massol, Asnieres, all of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 6, 1979, Ser. No. 27,912
Claims priority, application France, Dec. 8, 1978, 78 34616
Int. Cl.[2] C03B 37/02
U.S. Cl. 65—6 **1 Claim**



1. Method for fiberizing molten glass by the use of a spinner having a peripheral wall with a plurality of rows of orifices for centrifugal projection of streams of the glass, the spinner being positioned within a downwardly directed annular gaseous blast, characterized by feeding the glass to be fiberized into a spinner formed of an alloy consisting essentially and by weight of the following composition:

Elements	Ranges
C	0.65–0.83
Cr	27.5–31
W	6–7.8
Fe	7–10
Si	0.7–1.2
Mn	0.6–0.9
Co	0–0.2
P	0–0.03
S	0–0.02
Ni (balance)	~ 59–50

the glass consisting essentially of the following ingredients by weight:

SiO_2	60–64
Al_2O_3	5–6.5
Na_2O	14.5–18
K_2O	0–3
$R_2O = Na_2O + K_2O$	16–18
Al_2O_3/R_2O	(0.25–0.4)
CaO	5–9
MgO	0–4
MgO/CaO	0–0.75
MgO + CaO	8–9.5
MnO	1.5–4
BaO	trace
Fe_2O_3	0.8–3.5
$MnO + BaO + Fe_2O_3$	3.5–6.5
B_2O_3	trace
Miscellaneous	≦ 1
of which SO_3	≦ 0.6

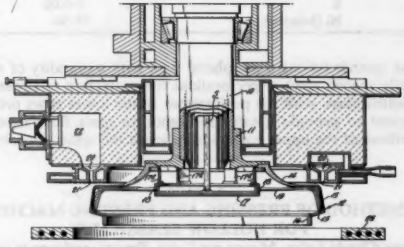
the glass being substantially free of fluorine, boron and barium.

4,203,747

GLASS FIBERIZATION SPINNER ALLOY AND USE THEREOF

Igor Fezenko, Aubervilliers, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 9, 1979, Ser. No. 28,211
Claims priority, application France, Dec. 8, 1978, 78 34616
Int. Cl.[2] C03B 37/02
U.S. Cl. 65—6 **2 Claims**



1. A hollow centrifugal glass fiberizing spinner adapted to be mounted for rotation about a generally upright axis within a surrounding annular gas blast, the spinner being formed of an alloy consisting essentially and by weight of the following composition:

Elements	Ranges
C	0.65–0.83
Cr	27.5–31

-continued

Elements	Ranges
W	6–7.8
Fe	7–10
Si	0.7–1.2
Mn	0.6–0.9
Co	0–0.2
P	0–0.03
S	0–0.02
Ni (balance) ~	59–50

the spinner having a peripheral wall with a plurality of vertically spaced rows of perforations for projection of streams of molten glass.

4,203,748

GLASS FIBERIZATION SPINNER

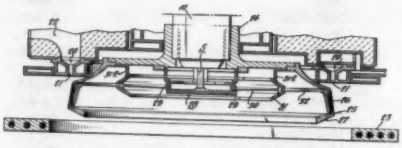
Jean A. Battigelli; Francois Bouquet, both of Rantigny, and Igor Fezenko, Aubervilliers, all of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 9, 1979, Ser. No. 28,393

Claims priority, application France, Dec. 8, 1978, 78 34616

Int. Cl.[2] C03B *37/04*

U.S. Cl. 65—14 **3 Claims**



1. A hollow centrifugal glass fiberizing spinner adapted to be mounted for rotation about a generally upright axis within a surrounding annular gas blast, the spinner being formed of an alloy of the following composition:

Elements	Ranges
C	0.65–0.83
Cr	27.5–31
W	6–7.8
Fe	7–10
Si	0.7–1.2
Mn	0.6–0.9
Co	0–0.2
P	0–0.03
S	0–0.02
Ni (balance) ~	59–50

the spinner having a peripheral wall with a plurality of vertically spaced rows of perforations for projection of streams of molten glass, with the perforations of the lower rows proportioned to provide greater resistance to glass flow than the orifices of the upper rows with glass at the same viscosity.

4,203,749

METHOD OF PRESSING AND PRESSING MACHINE FOR HOLLOW GLASSWARE

Jean-Claude Laine, Meung sur Loire, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Aug. 17, 1978, Ser. No. 934,403

Claims priority, application France, Aug. 24, 1977, 77 25860

Int. Cl.[2] C03B *11/16*

U.S. Cl. 65—68 **17 Claims**

1. In a pressing machine for articles of moldable material having a rotatable molding plate, advancing means for rotating the plate in a step-by-step advance movement, means for mounting a plurality of molds on the plate, a plurality of discharging devices and a plurality of pressing devices positioned about the periphery of the plate for respectively placing molten material into each of the molds, and molding the material into articles of the desired shape, the improvement wherein:

(a) the advancing means includes selectively operable means for advancing the plate through a first series of advance steps of equal distances as measured in terms of a fraction of revolution of the plate and through a second series of advance steps equal to a whole multiple of the distance of the first advance steps;

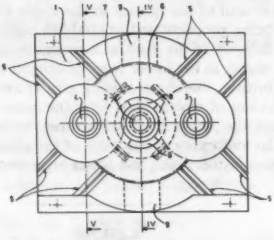
(b) the discharging and pressing devices are divided into a plurality of groups, one group including:

(1) a first set of discharging devices angularly spaced from each other by a distance equal to a fraction of the first advance step,

(2) a first set of pressing devices angularly spaced from each other by a distance equal to said fraction of the first advance step and spaced, in the direction of advancement of the plate, from the respective ones of the first set of discharging devices by a distance equal to said first advance step,

and a second group including:

(1) a second set of discharging devices angularly spaced from each other by a distance equal to said first advance step, with one of the second set thereof being located centrally between the first set of discharging devices and the other of the second set being located centrally of the first set of pressing devices, and



(2) a second set of pressing devices angularly spaced from each other by a distance equal to said first advance step and angularly spaced in the direction of advancement of the plate from the respective ones of the second set of discharging devices by a distance equal to said second advance step; and

(c) means for selectively controlling the operation of the discharging and pressing devices independently of each other.

16. In the process for pressing articles of moldable material by the action of one or a plurality of hydraulically controlled dies on the raw material, specifically one or a plurality of parisons in one or a plurality of molds, the improvement wherein the travel of each of the dies has the following sequential steps:

(a) rapid and controlled descent of the die;

(b) slow and controlled descent during the pressing operation;

(c) holding of the die under pressure in low position in the mold for a given time;

(d) decompressing the hydraulic control for the die while the die is in the low position in the mold;

(e) holding of the die during decompression in low position in the mold; and

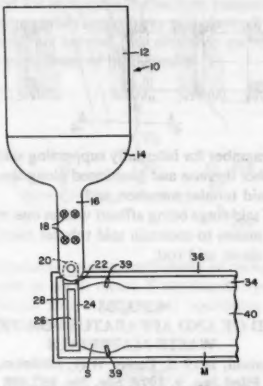
(f) rapid and controlled ascent of the die.

4,203,750

MANUFACTURE OF FLAT GLASS

George C. Shay, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 5, 1979, Ser. No. 27,522
Int. Cl.² C03B 18/02
U.S. Cl. 65—99 A 10 Claims



1. A method of delivering a sheet of substantially homogeneous molten glass to the surface of a bath of molten metal for producing float glass which comprises, delivering molten glass to a relatively narrow conditioning channel, flowing said molten glass longitudinally through said channel while simultaneously stirring such glass and producing a substantially homogeneous glass consistency, delivering said stirred and homogeneous glass to the inlet end of an overflow channel having opposed sidewalls, flowing such glass longitudinally along such channel and simultaneously overflowing at least one of said sidewalls and forming a downward flowing sheet-like flow of molten glass, and depositing said sheet of substantially homogeneous molten glass on the surface of a bath of molten metal for forming a ribbon of float glass.

10. Apparatus for forming float glass which comprises, means for retaining a longitudinally extending bath of molten metal, distributor means positioned above and transversely of said molten metal bath means, said distributor means having an inlet end positioned transversely of the longitudinal extent of said molten metal bath means, means for producing homogeneous molten glass, means for delivering said homogeneous molten glass directly from said homogeneous producing means to the inlet end of said distributor means, and channel means forming a part of said distributor means for flowing said homogeneous glass transversely of said longitudinally extending molten bath means and for overflowing a sheet of homogeneous molten glass for delivery to said molten bath means.

4,203,751

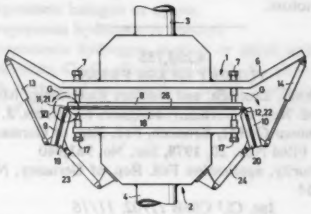
METHOD AND APPARATUS FOR MAKING CONVEX SHEETS OF GLASS HAVING A SMALL RADIUS OF CURVATURE

Mario Roth; Hans-Peter Siemonsen, both of Aachen; Günther Schmidt, Aachen-Richterich; Hubert Sonntag, and Leo Peters, both of Herzogenrath, all of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Sep. 14, 1978, Ser. No. 942,272
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741965
Int. Cl.² C03B 23/02
U.S. Cl. 65—106 23 Claims

1. A process for making a convex sheet of glass having a substantial bent portion of small radius of curvature comprising the steps of vertically suspending a flat sheet of glass, heating said flat sheet to a bending temperature, confining said flat sheet between two molds having matching center elements and matching jointed elements, and moving simultaneously the matching jointed elements of both molds with respect to the center elements in the same direction to bend a portion of said sheet confined by said jointed elements with respect to a portion of said sheet confined by said center elements.

7. A device for making a convex sheet of glass having a substantial bent portion of small radius of curvature including suspension means for vertically suspending a flat sheet of glass,



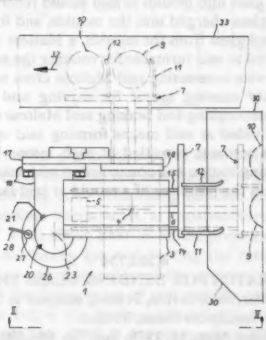
a female mold and a male mold movable respectively towards and away from each other adapted to engage a sheet of glass suspended therebetween, said mold having two matching center elements and at least one set of two opposed matching jointed elements connected to one end of the center elements with the matching jointed elements of a set being simultaneously movable with respect to the center elements about an axis to confine a portion of a sheet of glass and to impart a bend in a sheet of glass engaged by said molds, and means for moving said matching jointed elements about said axis.

4,203,752

MULTI-STATION GLASS-FORMING MACHINE

Kurt Becker, Obernkirchen; Hermann Büogert, Aeutal; Siegfried Schwarzer, Stockse, and Hans-Georg Seidel, Rinteln, all of Fed. Rep. of Germany, assignors to Hermann Heye KG, Obernkirchen, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 947,185
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 2746675
Int. Cl.² C03B 9/44, 35/00
U.S. Cl. 65—163 17 Claims



1. In a multi-station machine, particularly a glass-forming machine producing glass articles, of the type in which each station of the machine deposits articles produced at that station onto a respective deposit location, an article transfer system comprising a common conveyor extending along the stations of the multi-station machine and serving to carry away articles produced at the stations; plural article transfer means each

operative when activated for engaging at least one article at the deposit location of a respective station, performing a transfer motion transferring such article or articles onto the e common conveyor, and then performing a return motion returning to starting position for another such article transfer; a plurality of rotary electric motors each coupled in driving connection to the article transfer means of a respective one of the stations and each supplying motion to the respective article transfer means for causing the same to perform the transfer and return motions; and control means connected to the rotary electric motors and operative for controlling the rotation of each motor individually independently of the rotation of the respective remaining motors.

4,203,753

TURRET GLASS PRESS

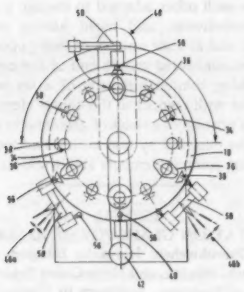
Eberhard Liebal, Kronach, and Norbert Eichenberg, Michelau, both of Fed. Rep. of Germany, assignors to Messrs. J. Walter Co. Maschinen GmbH, Kronach, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 961,940

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752814

Int. Cl.[2] C03B *11/02, 11/16*

U.S. Cl. 65—163 **12 Claims**



1. A turret glass press comprising a turntable having means forming a plurality of equally circumferentially spaced mould-receiving stations, means forming operating stations which are stationary with respect to the rotary motion of said turntable for charging glass into moulds in said mould receiving stations, for pressing glass charged into the moulds, and for withdrawing the pressed glass from the moulds, a Maltese cross mechanism connected to said turntable for rotating the same, a clutch and brake device connecting said Maltese cross mechanism to a continuously running motor for driving said mechanism, scanners for uncoupling and braking said Maltese cross mechanism and provided at said means forming said operating stations, and an actuator provided at each means forming said mould-receiving station and connected to said scanners so as to be operative in the presence of a mould at said last-mentioned station.

4,203,754

APPARATUS FOR BENDING GLASS SHEETS

M. Pierre Potier, Sartrouville, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Mar. 13, 1978, Ser. No. 886,101

Claims priority, application France, Mar. 18, 1977, 77 08119

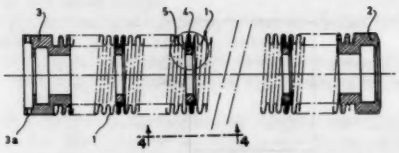
Int. Cl.[2] C03B *23/02*

U.S. Cl. 65—273 **8 Claims**

1. In a continuous glass sheet conveying and bending device of the type including a rod having a curved portion, a rotary flexible tubular member slidably disposed about at least said curved portion of said rod for supporting and conveying the glass sheet thereover, and a pluality of rings rotatably disposed on said rod and within said tubular member, the improvement wherein:

(a) said rotary tubular member is of solid wall construction lengthwise thereof with internal threading;

(b) a plurality of annular support means having external threading maing with the internal threading of said rotary



tubular member for internally supporting said rotary tubular member thereon and positioned along spaced locations within said tubular member; and

(c) each of said rings being affixed within one of said annular support means to maintain said tubular member in rotary relation about said rod.

4,203,755

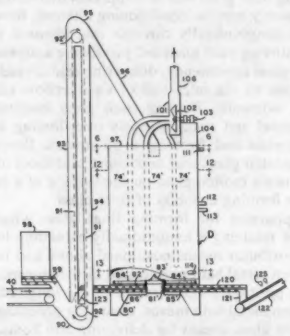
METHOD OF AND APPARATUS FOR TREATING WASTE MATERIALS

Konrad Ruckstuhl, 1019 E. Easter Way, Littleton, Colo. 80122

Filed Jan. 9, 1978, Ser. No. 867,698

Int. Cl.[2] C05F *11/08, 9/00*

U.S. Cl. 71—9 **13 Claims**



1. A process for treating waste material which may include magnetic and non-magnetic metal material and which includes cellulosic fiber materials, relatively hard materials having a hardness on the order of glass, ceramic, and stone, relatively soft material, on the order of food waste or lawn waste and intermediate material, which comprises:

(a) separating removable magnetic metal material present;

(b) comminuting the remaining material, including impacting the hard material, to produce sufficiently small sizes for separation;

(c) separating finely divided material including relatively hard and relatively soft material simultaneously by passing through apertures;

(d) separating and removing lighter cellulosic fiber material;

(e) separating and removing intermediate material;

(f) introducing increments of separated, relatively hard and relatively soft, finely divided material into the upper portion of a compost producing treatment space;

(g) recirculating portions of said material from the lower portion of said treatment space into the upper portion of said treatment space; and

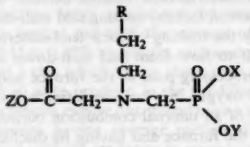
(h) discharging portions of treated material from the lower portion of said treatment space.

4,203,756
METHOD FOR INCREASING THE SUCROSE CONTENT OF GROWING PLANTS

Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1978, Ser. No. 972,540
Int. Cl.[2] A01N 5/00
U.S. Cl. 71—86 12 Claims

1. A method for increasing the sucrose content of sugarcane plants which comprises applying to said plants, from about 2 to 10 weeks prior to harvest, an effective sucrose increasing amount of a compound of the formula



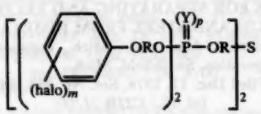
wherein R represents cyano, carbamoyl or carboxyl, X represents hydrogen or alkali metal, Y represents hydrogen, lower alkyl or phenyl, and Z represents hydrogen, lower alkyl, phenyl or alkali metal.

4,203,757
HALOPHENOXYALKOXY PHOSPHOROUS-CONTAINING SULFIDES

Fred S. Eiseman, Basking Ridge, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,373
Int. Cl.[2] A01N 9/36; C07F 9/141, 9/165
U.S. Cl. 71—87 18 Claims

1. A bis-(halophenoxyalkoxy)phosphino alkoxy sulfide having the formula:



wherein
each R is alkylene having from 1 to 3 carbon atoms;
Y is oxygen of sulfur
m is an integer having a value of from 1 to 3;
p is 0 or 1
and wherein
P is trivalent phosphorous when p is 0 and is pentavalent phosphorous when p is 1.

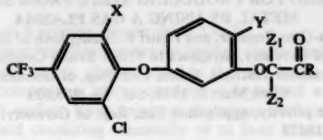
6. The process for inhibiting the growth of weeds which comprises contacting the plant or plant situs with a herbicidally effective amount of the compound of claim 1.

4,203,758
HERBICIDAL PHENOXY-PHENOXYALKANE THIO ESTERS

Ryuzo Nishiyama, Takatsuki; Ryohei Takahashi, Tokyo; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Itaru Shigehara, Kusatsu, and Nobuyuki Sakashita, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Limited, Osaka, Japan

Division of Ser. No. 722,327, Sep. 10, 1976, Pat. No. 4,070,177. This application Sep. 29, 1977, Ser. No. 837,815
Claims priority, application Japan, Sep. 27, 1975, 50-115982; Mar. 5, 1976, 51-23084; Mar. 17, 1976, 51-28189
Int. Cl.[2] A01N 9/12; C07C 153/07
U.S. Cl. 71—100 9 Claims

1. A compound having the formula:



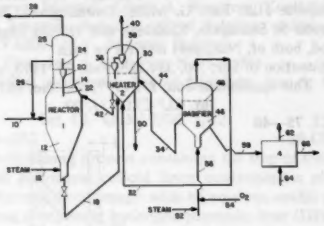
wherein
X represents hydrogen or chlorine;
Y represents halogen or cyano;
Z_1 represents hydrogen or methyl;
Z_2 represents hydrogen, methyl or ethyl; and R is C_1–C_4 alkylthio, C_2–C_4 alkenylthio or C_2–C_4 alkynylthio.

9. A herbicidal composition, which comprises: the compound of claim 1 and an agriculturally acceptable adjuvant.

4,203,759
PROCESS FOR THE PREPARATION OF A VANADIUM-CONTAINING METALLIC ASH CONCENTRATE

William J. Metrailer, and David E. Mueller, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 1, 1978, Ser. No. 901,700
Int. Cl.[2] B22F 9/00
U.S. Cl. 75—0.5 BA 6 Claims



1. A process for producing a particulate vanadium-containing low density metallic ash concentrate which comprises: partially gasifying coke comprising metallic components, including vanadium components, at a temperature ranging from about 1600° F. to about 2000° F. in the presence of steam and an oxygen-containing gas and heating the resulting partially gasified coke comprising said metallic components at a temperature below the fusion point of said metallic components, said temperature below the fusion point being a temperature not greater than about 1050° F., in the presence of a molecular oxygen-containing gas, for a time sufficient to burn at least a portion of the coke therefrom, and to produce a particulate vanadium-containing low-density metallic ash concentrate, at least 50% of the particles of said concentrate having a diameter not greater than about 1 micron.

6. The process of claim 1 wherein said metallic components comprise iron, nickel and vanadium metals or metal compounds thereof.

4,203,760

METHOD FOR PRODUCING STEEL FROM SPONGE METAL BY USING A GAS PLASMA

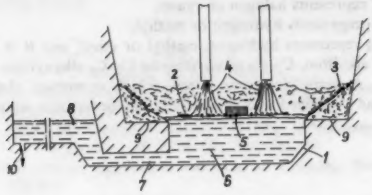
Heinrich-Otto Rossner, and Henri F. Seelig, both of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 885,021

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2710377

Int. Cl.[2] C21C *5/52*

U.S. Cl. 75—12 6 Claims



1. In a method for producing steel by refining raw sponge iron material containing a matrix of impurities and sponge iron with the use of a gas plasma formed by a plasma burner, in a melting vessel containing a metal bath, the sponge iron being fed into the melting vessel, the improvement comprising the steps of:

(a) feeding the sponge iron material into the melting vessel by forming a thin floating layer of sponge iron material on the surface of the metal bath,

(b) directly melting by the plasma the sponge iron in the sponge iron material that is fed into the melting vessel without the addition of base or acid substances, and

(c) continuously removing from the metal bath slag produced from the melting of the sponge iron.

4,203,761

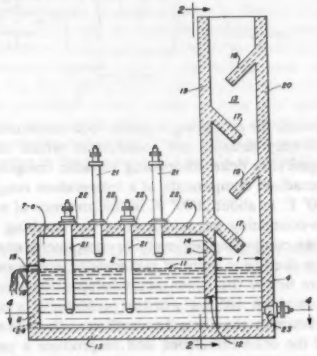
PROCESS OF SMELTING WITH SUBMERGED BURNER

Robert N. Rose, Darien, Conn., assignor to Robert C. LeMay, Lafayette Hill; Earl G. Mills, Downingtown, both of, Pa.; Chester S. Stackpole, Elizabeth and Harold Massey, Ridgewood, both of, N.J., part interest to each

Continuation of Ser. No. 334,225, Feb. 21, 1973, abandoned. This application Jun. 17, 1977, Ser. No. 807,567

Int. Cl.[2] C21B *11/00*

U.S. Cl. 75—40 6 Claims



1. A metalurgical process which includes maintaining a melt-down non-circulating pool in a furnace by interacting a fluid fuel and oxygen in a heat-insulating refractory combustion chamber of an internal-combustion burner separate and distinct from the furnace and having its discharge below the metal-line and above the bottom of the pool of molten metal, the interaction between the fuel and the oxygen, of which the same are capable, being substantially completed within said combustion chamber, and with none of the interaction between the fuel and oxygen taking place below the bottom of the pool of molten metal, and injecting into the melt-down pool substantially below its top and above its bottom the resultant hot gases issuing from said combustion-chamber and passing such hot gases upwardly through the melt-down pool, and feeding material to be melted to said melt-down pool and passing the hot gases which have risen through the melt-down pool through said material-feed counter-current to the feeding movement thereof, thereby causing said melt-down pool to be augmented by the melting of such feed-material, causing the excess of melt to flow from said melt-down non-circulating pool into a processing-pool in the furnace and interacting a fluid fuel and oxygen in a heat-insulating refractory combustion chamber of an internal combustion burner separate and distinct from the furnace and having its discharge below the top and above the bottom of the melt in the processing pool, the interaction between the fuel and the oxygen, of which the same are capable, being substantially completed within said combustion chamber, and with none of the interaction between the fuel and oxygen taking place below the bottom of the processing pool, and injecting into the melt in the processing-pool, substantially below its top and above its bottom the resultant hot gases issuing from said combustion-chamber and passing such hot gases upwardly through the melt in the processing-pool, and causing said hot gases which have risen through said processing-pool to merge with the hot gases which have risen through the said melt down pool so as to pass therewith through the aforementioned material-feed, and drawing off metal from said processing-pool.

4,203,762

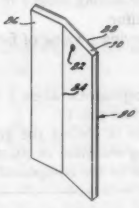
PROCESS FOR SEPARATING AND RECOVERING ALUMINUM AND STEEL FROM BIMETAL SCRAP

John L. Dansereau, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Dec. 11, 1978, Ser. No. 968,194

Int. Cl.[2] C22B *21/00*

U.S. Cl. 75—68 R 10 Claims



1. A method for processing bimetallic scrap to separate and recover the aluminum lining from the ferrous substrate without incurring appreciable formation of contaminating iron-aluminum intermetallic compounds comprising the steps of introducing the bimetallic scrap into a furnace chamber, rapidly heating said scrap through a critical temperature range commencing at about 842° F. to a temperature above the melting point of the aluminum lining to convert said lining to the liquid state, removing the liquid aluminum as it is formed from the surface of the ferrous substrate to minimize reaction between the aluminum and iron to avoid any significant formation of iron-aluminum intermetallic compounds and separately recovering the aluminum and ferrous constituents.

4,203,763

METHOD OF MANUFACTURING A LEAD ALLOY STEEL AND A STEEL MADE ACCORDING TO THE METHOD

M. K. Olof Johnsson, Degerfors; Karl-Erik Öberg, Viken, and Harry Bertheussen, Degerfors, all of Sweden, assignors to Scandinavian Lancers Aktiebolag, Hoganas, Sweden

Filed Nov. 22, 1978, Ser. No. 962,936
Claims priority, application Sweden, Dec. 21, 1977, 7714561
Int. Cl.[2] C22C 33/08
U.S. Cl. 75—129 10 Claims

1. A method of manufacturing a lead alloy steel, wherein lead bearing particles are injected beneath the surface of a body of molten steel, said particles having a diameter less than 5 mm, said injection being carried out by introducing the particles with a neutral gas until the content of lead in the molten steel is 0.15 to 0.35% by weight, said neutral carrier gas being injected at a rate which brings about very efficient stirring of the melt so as to produce, in the solidified steel, small metallic lead inclusions evenly distributed over a section of the steel, said inclusions having average particle diameters less than 100 μm, and without tendency to macrosegregations of lead, and wherein prior to the injection of said lead bearing particles, the molten steel is deoxidized by treatment with up to 2 kg aluminum per ton steel, and a calcium compound is added to the molten steel during a stage which is not later than the lead injection to form a slag, the major portion of the entire content of aluminum being collected in the slag so that the aluminum content in the finished steel does not exceed 0.010% by weight.

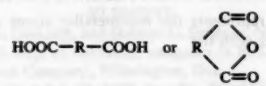
4,203,764

POLYESTER OR POLYURETHANE COATED ELECTROSTATIC IMAGE HOLDING MEMBER

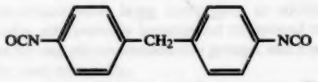
Umi Tosaka, Tokyo; Hideyo Kondo, Toride; Kelichi Murai, Tokyo, and Hitoshi Toma, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 797,172, May 16, 1977, abandoned.
This application Dec. 15, 1978, Ser. No. 969,888
Claims priority, application Japan, May 17, 1976, 51-56342; Jun. 15, 1976, 51-70183; Aug. 23, 1976, 51-100834; Sep. 16, 1976, 51-111048; Sep. 30, 1976, 51-117569
Int. Cl.[2] G03G 5/00, 8/00
U.S. Cl. 430—67 6 Claims

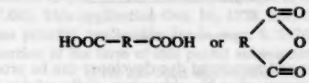
1. An image holding member for holding electrostatic image and/or toner image, characterized in that the surface of the image holding member has a surface layer, said surface layer essentially consisting of at least one of the substance A and B wherein the substance A represents a linear polyester having a structural unit —OOC—R—COO—R'—in which the dibasic acid compound is:



and the diol compound is HO—R'—OH, wherein R and R' are organic groups and are the same or different within each said structural unit, such that each said structural unit is the same or different, said polyester having a molecular weight in the range of 5,000 to 50,000 and is soluble in organic solvent, and the substance B represents a polymerization product of a linear isocyanate compound of the formula:



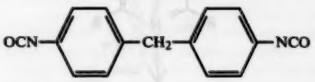
and a polyol compound of the formula:



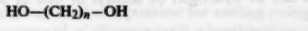
wherein n is a positive integer from 2 to 20 .

5. An image holding member for holding electrostatic image and/or toner image, characterized in that the image holding member comprises a photo conductive layer and a surface layer, said surface layer being on the upper surface of said member and consisting essentially of at least either one of substances A and B wherein the substance A represents a linear polyester having a structural unit —OOC—R—COO—R'—in which the dibasic acid compound is:

and the diol compound is HO—R'—OH, wherein R and R' are organic groups and are the same or different within each said structural unit, such that each said structural unit is the same or different, said polyester having a molecular weight in the range of 5,000 to 50,000 and is soluble in organic solvent, and the substance B represents a polymerization product of a linear isocyanate compound of the formula:



and a polyol compound of the formula:



wherein n is a positive integer from 2 to 20.

4,203,765

ETCH BLEACHING LIQUID WITH IRON(III)IONS

Danië A. Claeys, Mortsel; Albert A. Reyniers, Kontich, and Wilhelmus Janssens, Aarschot, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jun. 1, 1978, Ser. No. 911,484
Claims priority, application United Kingdom, Jun. 1, 1977, 23204/77
Int. Cl.[2] G03C 7/00, 5/32
U.S. Cl. 430—252 10 Claims

1. An etch-bleaching process containing the step of treating a hydrophilic polymeric colloid layer comprising a photographically formed silver image with an aqueous acidic etch-bleach solution comprising hydrogen peroxide, iron (III) ions and inorganic anions that form a silver salt having a solubility product not greater than 1×10^{-8} determined in water at 20° C., characterized in that this solution contains in the dissolved state the combination of citric acid and a polymer containing alkylene oxide units, whereby improved stabilization of the hydrogen peroxide is obtained.

4,203,766

PHOTOGRAPHIC PRODUCTS COMPRISING DYE DEVELOPERS AND N-OXIDES

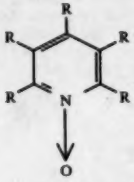
Gerard J. Bourgeois, Kingston; Russell A. Gaudiana, Merrimack, both of N.H., and Ronald A. Sahatjian, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 811,083, Jun. 29, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,868
Int. Cl.[2] G03C 7/00, 5/54, 1/40, 1/10
U.S. Cl. 430—243 45 Claims

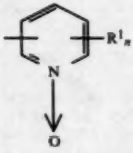
35. A diffusion transfer process which comprises the steps of:

(a) photoexposing a photosensitive element which includes at least one silver halide emulsion layer associated with a dye developer;

(b) contacting the photoexposed element with a processing composition so that said photoexposed silver halide emulsion layer and associated dye developer can be processed in the presence of an N-oxide substantially soluble in said processing composition, said N-oxide having a polarographic reduction potential less positive than the polarographic oxidation potential of said dye developer(s) and conforming to the following formula:



where each R can be hydrogen or methyl or one of said R groups can be:



wherein R^1 is methyl and n is zero or an integer of from 1 to 4; and

(c) developing said photoexposed silver halide layer to provide, as a function of said development, an imagewise distribution of dye image providing material which is transferred by diffusion to an image receiving layer.

4,203,767

AMPLIFICATION PROCESS FOR LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Mitsuto Fujiwhara; Syunji Matsuo; Yutaka Kaneko; Toyoaki Masukawa, and Mikio Kawasaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro-machi, Japan

Continuation of Ser. No. 640,268, Dec. 12, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,983

Claims priority, application Japan, Dec. 16, 1974, 48144615

Int. Cl.[2] G03C 7/00

U.S. Cl. 430—376 **4 Claims**

1. A process for providing a color image which process comprises imagewise exposing a multi-layered light-sensitive photographic material comprising a support and a light-sensitive silver halide emulsion layer not having a coupler incorporated therein and a layer contiguous therewith, said emulsion layer or the layer contiguous therewith containing oil particles of a high boiling solvent, and developing said exposed photographic material with a coupler-containing color developer and processing said developed photographic material with an amplifying solution.

4,203,768

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMATION OF COLOR PHOTOGRAPHIC IMAGES

Kozo Inouye, and Hideki Naito, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

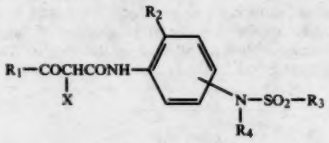
Filed Sep. 26, 1978, Ser. No. 945,946

Claims priority, application Japan, Sep. 26, 1977, 52-115265

Int. Cl.[2] G03C 7/00, 1/40

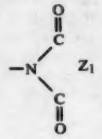
U.S. Cl. 430—388 **9 Claims**

9. A method for formation of color photographic images which comprises developing an image-wise exposed photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer with a primary aromatic amine color developing agent in the presence of a yellow dye-forming coupler represented by the following general formula (I):



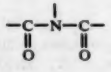
(I)

wherein R_1 represents an alkyl group or a monocyclic aryl group; R_2 represents a chlorine atom or a lower alkoxy group having 1 to 4 carbon atoms; R_3 and R_4, which may be the same or different, each represents a straight chain or branched chain alkyl group having 1 to 22 carbon atoms, a phenoxyalkyl group having 7 to 32 carbon atoms, a monocyclic aralkyl group having 7 to 32 carbon atoms, a phenyl group or a substituted phenyl group; and X is selected from the group consisting of groups represented by the following general formulae (III) to (V):



(III)

wherein Z_1 represents the non-metallic atoms necessary to form together with the



moiety a 5-membered ring or a 6-membered ring,

(IV)

wherein Z_2 represents the non-metallic atoms necessary to form together with the

moiety an unsaturated 5-membered ring or an unsaturated 6-membered ring, or

(V)

wherein Z_3 represents the non-metallic atoms necessary to form together with

an imidazole ring, a triazole ring or a tetrazole ring.

4,203,769

RADIATION-SENSITIVE ELEMENTS HAVING AN ANTISTATIC LAYER CONTAINING AMORPHOUS VANADIUM PENTOXIDE

Claude Guestaux, Colombes, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,187

Claims priority, application France, Jul. 15, 1975, 75 22060

Int. Cl.² G03C *1/00, 1/06*

U.S. Cl. 430—631 **16 Claims**

1. In a radiation-sensitive element comprising a support, at least one image-forming layer, and an antistatic layer; the improvement wherein said antistatic layer has been formed by the coating and subsequent drying of an antistatic composition comprising an aqueous solution of an amorphous antistatic material, said aqueous solution having been produced by forming a melt comprised of at least 80% by weight of V_2O_5 and casting said melt into a solubilizing amount of water, said melt having been heated to a temperature in the range of from 790° C. to 1190° C. and cast into said solubilizing amount of water while at a temperature of at least 740° C.

4,203,770

NEGATIVE TONABLE PHOTOHARDENABLE ELEMENT

Mario Grossa, Dreieich, and Helmut G. Sandner, Nieder-Roden, both of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 20, 1978, Ser. No. 926,577

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733581

Int. Cl.² G03C *1/78, 1/96*

U.S. Cl. 430—270 **8 Claims**

1. A photohardenable element for the preparation of negative tonable images comprising

(1) a support;

(2) an intermediate layer consisting essentially of one or more thermoplastic polymeric binders;

(3) a photohardenable layer comprising an addition polymerizable ethylenically unsaturated compound or a compound having photocrosslinkable groups, and a polymeric binder; and optionally,

(5) a removable cover sheet, the improvement wherein over layer (3) is a layer

(4) which is tonable and which comprises a polymeric binder and a nonvolatile diffusible component which can diffuse imagewise from the tonable layer thereby removing tonability in the areas of the tonable layer from which diffusion occurs.

4,203,771

GREEN SAND COMPOSITION FOR CASTING

Hirofumi Matsui, No. 6-16, 2-chome, Higashi, Shibuya-ku, Tokyo, Japan

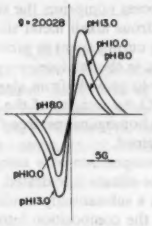
Continuation-in-part of Ser. No. 785,312, Apr. 8, 1977, Pat. No. 4,137,085. This application Oct. 16, 1978, Ser. No. 951,800

Claims priority, application Japan, Apr. 8, 1976, 51-40047

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.35 **18 Claims**



1. A green sand composition for casting comprising a green sand composed of siliceous sand, a combination of Na-type and Ca-type bentonite, and water, and having incorporated therein a component selected from the group consisting of (a) a waste liquor of a pH of 9 to 13 obtained in the soda process, kraft process, or oxygen-alkali cooking process for preparing pulps from woods or non-wooden raw materials, or a concentrate or powder formed from said waste liquor, (b) a waste liquor of a pH of 9 to 13 obtained by cooking a wood or non-wooden material with a liquid mixture of sodium sulfite with sodium hydroxide or sodium carbonate, or a concentrate or powder prepared from said waste liquor, (c) a mixture of a solution of an alkali lignosulfonate having a pH of 9 to 13 with a monosaccharide or polysaccharide or a monosaccharide-or polysaccharide-containing residue left after removing thiolignin from a kraft pulp waste liquor, the mixing ratio being in the range of 30/70 to 70/30 based on the solids, and (d) a mixture of at least two components selected from said components (a), (b) and (c), the amount incorporated of said component (a), (b), (c) or (d) as the solids thereof being at least 0.01% by weight based on the siliceous sand.

4,203,772

POROUS ZIRCONIA CONTAINING CERAMICS

Allen D. Davis, Jr., Louisville, Ky.; Herbert L. Johns, Madison, Ohio, and Irwin M. Lachman, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 788,614, Apr. 18, 1977, abandoned. This application Jan. 12, 1978, Ser. No. 868,888

Int. Cl.² C04B *35/48*

U.S. Cl. 106—40 R **15 Claims**

1. A method of fabricating a porous sintered zirconia-containing ceramic body including the steps of

(a) formulating a batch of ceramic material which contains zirconia, and

(b) shaping the batch into a green body, and firing the green body to transform it into a sintered body, wherein the improvement comprises

(c) incorporating into the batch zirconium hydroxide in an amount greater than 11 wt.% of ceramic material plus hydroxide.

4,203,773

LIGHTWEIGHT SILICATE AGGREGATE

Ralph E. Temple, Chardon, and William T. Gooding, Jr., Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Nov. 13, 1978, Ser. No. 959,517
Int. Cl.[2] C04B *21/00, 31/02*
U.S. Cl. 106—40 R **12 Claims**

1. A process for the preparation of lightweight silicate aggregate, which process comprises the steps of:

(a) mixing anhydrous alkali metal silicate and sufficient boron-containing curing agent to provide a boron content of 0.5–2.5 percent in the mixture,

(b) adding water to provide from about 17 percent to about 25 percent H_2O, by weight, of the total mixture,

(c) mixing until a homogeneous, free-flowing powdery composition is obtained,

(d) curing the composition at a temperature below about 100° C. until the silicate is hydrated, while maintaining the composition in a substantially nonliquid state,

(e) comminuting the composition into discrete free-flowing particles, and

(f) expanding the particles by rapid heating to at least 425° C. to produce an aggregate having a bulk density of less than about 56 kg per cubic meter.

4,203,774

GLASS COMPOSITION AND FIBERS

Jean A. Battigelli; Francois Bouquet, both of Rantigny, and Jean-Jacques Massol, Asnieres, all of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 9, 1979, Ser. No. 28,212
Claims priority, application France, Dec. 8, 1978, 78 34616
Int. Cl.[2] C03C *13/00*
U.S. Cl. 106—50 **9 Claims**

1. Fiberizable glass consisting essentially of the following ingredients in the amounts indicated by weight, and characterized by a viscosity in a range above 1000 poises at a temperature of about 950° C. up to about 5000 poises at a temperature of about 1050° C.:

SiO_2	60–64
Al_2O_3	5–6.5
Na_2O	14.5–18
K_2O	0–3
$R_2O = Na_2O + K_2O$	16–18
Al_2O_3/R_2O	(0.25–0.4)
CaO	5–9
MgO	0–4
MgO/CaO	0/0.75
MgO + CaO	8–9.5
MnO	1.5–4
BaO	trace
Fe_2O_3	0.8–3.5
MnO + BaO + Fe_2O_3	3.5–6.5
Miscellaneous	≦1
of which SO_3	≦0.6

9. Glass fibers formed from glass consisting essentially of the following ingredients in the amounts indicated by weight:

SiO_2	59–65
Al_2O_3	4–8
Na_2O	12.5–18
K_2O	0–3
$R_2O = Na_2O + K_2O$	15–18
Al_2O_3/R_2O	0.25–0.4
CaO	4.5–8
MgO	0–4
MgO/CaO	0/0.75
MgO + CaO	7–0.75
MnO	1–3.5
BaO	2–3.5
Fe_2O_3	0.1–1
MnO + BaO + Fe_2O_3	4–8
B_2O_3	0–2
Miscellaneous	≦1
of which SO_3	≦0.6

4,203,775

Patent Not Issued For This Number

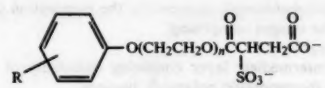
4,203,776

AQUEOUS FORTIFIED ROSIN DISPERSIONS

Richard W. Greiner, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 790,650, Apr. 25, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,898
Int. Cl.[2] C08L *93/04*
U.S. Cl. 106—238 **10 Claims**

1. In the invention process of preparing paper size from fortified rosin wherein molten fortified rosin and water containing a dispersing agent are first mixed to provide an emulsion wherein the molten fortified rosin is the continuous phase and the water is the disperse phase and the emulsion is subsequently inverted by the addition of water to provide an emulsion wherein the water is the continuous phase and the fortified rosin is the disperse phase, the improvement wherein there is employed as the dispersing agent one or more water-soluble compounds which provide in solution one or more anions of the formula



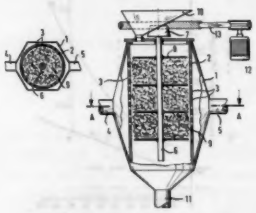
wherein R is a normal or branched chain alkyl containing from 4 through 18 carbon atoms, and n is an integer 4 through 25.

4,203,777

METHOD FOR PURIFYING PARTICULATE MOULD MATERIAL

Hermann Jacob, Fachenfelderweg 115, 2105 Seevetal 3, Fed. Rep. of Germany

Continuation of Ser. No. 545,014, Jan. 29, 1975, Pat. No. 4,089,081. This application Feb. 21, 1978, Ser. No. 879,868
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1974, 2404702; Dec. 20, 1974, 2460594
Int. Cl.² B08B 1/00
U.S. Cl. 134—7 9 Claims



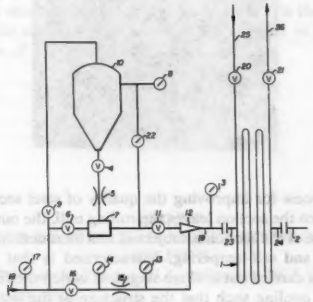
1. A method of purifying particulate material, particularly foundry sand, to remove adhering contaminants therefrom, comprising the steps of confining in an enclosed space at least one body of finely divided metallic material having sharp edges and defining a plurality of voids which are bounded by said sharp edges; passing a stream of the particulate material through the enclosed space so that the particles of the material travel through the voids and brush against the sharp edges bounding the same, whereby contaminants adhering to the particles are scoured off by the sharp edges; and withdrawing the scoured-off contaminants to purify the particulate material.

4,203,778

METHOD FOR DECOKING FIRED HEATER TUBES

David J. Nunciato, Missouri City, Tex.; Norman H. White, Amherst, N.Y., and William A. Woodburn, Kingwood, Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 17, 1978, Ser. No. 906,748
Int. Cl.² B08B 9/02
U.S. Cl. 134—7 5 Claims



1. A method for decoking fired heater tubes of a serpentine configuration used in hydrocarbon processing while maintaining the integrity of the tube walls and return bends comprising

(a) establishing a gas inlet to and a gas outlet from said fired heater tubes of a serpentine configuration;

(b) injecting a purge gas stream into the inlet while the outlet is open to atmosphere to purge the tubes of loose debris until the effluent is clear;

(c) entraining impact resistant, non-angular, non-abrasive particles into a propelling gas stream at a concentration of 0.1 to 1.0 pounds of particles per pound of propellant;

(d) introducing the impact resistant, non-angular, non-abrasive particle entrained gas stream into the inlet of said fired heater tubes of a serpentine configuration while the outlet remains open to the atmosphere at a gas flow rate corresponding to an outlet gas velocity of 14,000 to 20,000 feet per minute;

(e) maintaining the flow of the gas stream in step (d) until the inlet pressure to the tubes reaches a preselected maximum value;

(f) discontinuing entraining impact resistant, non-angular, non-abrasive particles into said propelling gas stream;

(g) continuing the flow of propelling gas into said tubes to clear such tubes of loose coke debris; and

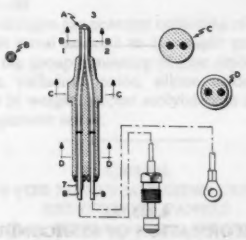
(h) repeating steps (c), (d), (e) and (f) until the tubes are clean, as evidenced by a coke-free clear effluent from the outlet whereby grinding-type abrasion of the tube walls and gouging-type abrasion of the return bends is eliminated.

4,203,779

FLAME DETECTION THERMOCOUPLE

Tadashi Kojima, and Kazuo Seki, both of Fujisawa, Japan, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1978, Ser. No. 963,632
Int. Cl.² H01L 35/02, 35/28
U.S. Cl. 136—233 4 Claims



1. A flame detecting thermocouple comprising

a first element which is composed of a high potential side thermoelectric material of an iron-chromium alloy,

a second element composed of a low potential side thermoelectric material formed of an alloy of 0.7 to 2% of yttrium, 45–70% copper and the remainder of the alloy is nickel, and

a welded connection of the ends of said first and second elements to provide a junction which can be heated by a flame to produce a thermoelectric output at the other ends of the elements.

4,203,780

FE ION IMPLANTATION INTO SEMICONDUCTOR SUBSTRATE FOR REDUCED LIFETIME SENSITIVITY TO TEMPERATURE

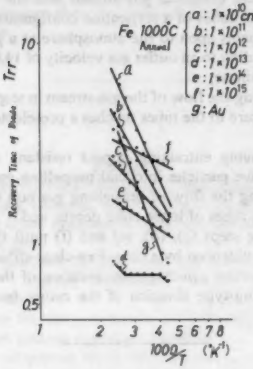
Takeshi Matsushita, Sagamihara; Takayoshi Mamine, Tokyo; Hisao Hayashi, Atsugi, and Kazuo Nishiyama, Yamato, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1978, Ser. No. 936,104
Int. Cl.² H01L 21/263, 29/167
U.S. Cl. 148—1.5 8 Claims

1. A method of Fe ion implantation into a semiconductor substrate of an N-type conductivity having a reduced lifetime sensitivity to temperatures comprising the steps of:

(a) implanting Fe ions into a semiconductor substrate of an

N-type conductivity from its surface with a dose amount of 10^{10} to 10^{15} cm^{-2};



(b) heat-treating said semiconductor substrate having Fe ions therein at 850° to 1250° C.

4,203,781

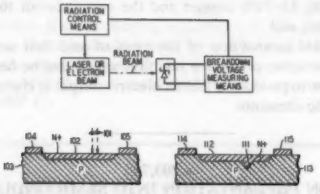
LASER DEFORMATION OF SEMICONDUCTOR JUNCTIONS

Gabriel L. Miller, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1978, Ser. No. 973,713

Int. Cl.² H01L *21/26*; H01J *37/30*

U.S. Cl. 148—1.5 **15 Claims**



1. A method of making a semiconductor device having a junction between a more heavily doped semiconductor and a less heavily doped semiconductor, the invention characterized by deforming a portion of the junction by directing substantially perpendicularly to the junction a radiation beam selected from the group consisting of laser beam and electron beam, said radiation beam having a diameter less than 100 microns and small compared to the area of the junction, and of sufficient intensity to melt the semiconductor material, until a portion of the more heavily doped region melts into the less heavily doped region.

4,203,782

STEEL HAVING A UNI-DIRECTIONAL LAMELLAR MARTENSITE STRUCTURE IN AN AUSTENITE MATRIX

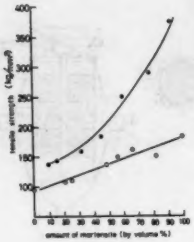
Senichi Yamada, and Yoshio Kato, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Jun. 28, 1978, Ser. No. 920,065

Claims priority, application Japan, Jun. 28, 1977, 52-76727

Int. Cl.² C21D *1/22, 9/02*

U.S. Cl. 148—12 E **37 Claims**



1. Steel having excellent resistance to hydrogen-brittleness cracking, having a tensile strength of at least 150 kg/mm^2 and a lower-limit strength of at least 100 kg/mm^2.

4,203,783

PROCESS FOR IMPROVING THE QUALITY OF STEEL SECTIONS

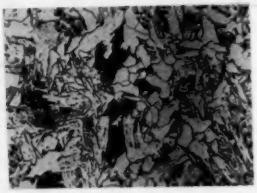
Marios Economopoulos, Liege, and Yves J. Respen, Herstal, both of Belgium, assignors to Centre de Recherches Metallurgiques, Brussels, Belgium

Filed Sep. 18, 1978, Ser. No. 943,392

Claims priority, application Belgium, Sep. 19, 1977, 858862

Int. Cl.² C21D *7/14*

U.S. Cl. 148—12.4 **2 Claims**



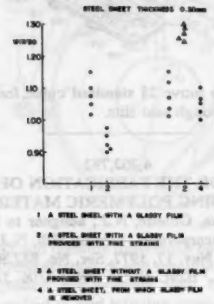
1. A process for improving the quality of steel sections, in which, when the section leaves the rolling mill, the outer layer of a flat face of the section is subjected to a treatment of surface quenching and self-tempering, characterised in that the said treatment is carried out in three stages, in which the first stage consists of cooling such that the structure of the outer layer comprises a mixture of austenite and ferrite, the second stage consists of rapid cooling by means of a suitable cooling liquid so that the structure of the outer layer comprises a mixture of ferrite and martensite and/or bainite, this second stage being interrupted so that the non-quenched parts of the sections comprising residual austenite are at a sufficiently high temperature to permit a tempering of the quenched outer layer by the heat in the non-quenched parts, and the third stage consists of slow cooling so that the austenite in the said non-quenched parts of the section transforms into ferrite and carbides.

4,203,784

GRAIN ORIENTED ELECTROMAGNETIC STEEL SHEET

Katsuro Kuroki, Kitakyushu, and Osamu Tanaka, Nohgata, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 4, 1978, Ser. No. 902,811
Claims priority, application Japan, May 4, 1977, 52-50667
Int. Cl.[2] H01F 1/04
U.S. Cl. 148—111 12 Claims


STEEL SHEET THICKNESS 0.30mm
WATTS
1.30
1.20
1.10
1.00
0.90
1 2
1 2 4
1 A STEEL SHEET WITH A GLASSY FILM
2 A STEEL SHEET WITH A GLASSY FILM PROVIDED WITH FINE STRAINS
3 A STEEL SHEET WITHOUT A GLASSY FILM PROVIDED WITH FINE STRAINS
4 A STEEL SHEET, FROM WHICH GLASSY FILM IS REMOVED

1. A method of treating a grain oriented steel to improve the iron loss which comprises treating a grain oriented electromagnetic steel sheet containing a glassy film formed by an annealing separator on the surface thereof and which sheet has been subjected to a finished annealing operation by imparting a plurality of linear strains to the base steel sheet through the glassy film by forcefully moving a rotatable body over the glassy film, said linear fine strains being formed at an angle of 45° or more to be the rolling direction of the steel sheet said linear strain having a depth of 5 μm or less, a width of 600 μm or less and wherein the distance between adjacent strains is 2.5 to 15 mm.

7. A grain oriented magnetic steel sheet having a glassy film on the surface thereof, which steel sheet has been subjected to a finishing annealing, said steel sheet containing silicon in an amount of 4.0% or less and being characterized in that it contains a plurality of strains imparted through the glassy film by a rotatable body, in which the strains have a depth of 5 μm or less, a width of 600 μm or less and the distance between the adjacent strains being 2.5 to 15 mm and wherein the direction of the fine strains is at an angle of 30° or more to the rolling direction of the steel.

4,203,785

METHOD OF EPITAXIALLY DEPOSITING CADMIUM SULFIDE

Frank Z. Hawrylo, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,239
Int. Cl.[2] H01L 21/208
U.S. Cl. 148—171 10 Claims

1. A method of epitaxially depositing a layer which includes cadmium sulfide on a substrate which method comprises the steps of:

placing a surface of the substrate into contact with a solution which includes cadmium sulfide dissolved in indium, and cooling said solution to precipitate out at least some of the cadmium sulfide which deposits on the substrate.

4,203,786

POLYETHYLENE BINDER FOR PYROTECHNIC COMPOSITION

Eugene F. Garner, Canyon Country, Calif., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 8, 1978, Ser. No. 913,915
Int. Cl.[2] C06B 45/10
U.S. Cl. 149—19.91 5 Claims

1. A pyrotechnic composition for the generation of a non-toxic, non-flammable and essentially smokeless inflating gas for an inflatable occupant safety restraint, said composition comprising, in approximate weight percent based on the total weight of the composition,

(a) 1 to 10% of a high density homopolymer of ethylene, having a density of about 0.92 to 0.97 at 23° C. as determined by ASTM Method D 792;

(b) 20 to 30% of a coolant selected from the group consisting of calcium hydroxide, magnesium hydroxide, calcium carbonate and magnesium carbonate, and

(c) 60 to 79% of an inorganic oxidizer selected from the group consisting of sodium chlorate, potassium chlorate, sodium perchlorate and potassium perchlorate.

4,203,787

PELLETIZABLE, RAPID AND COOL BURNING SOLID NITROGEN GAS GENERANT

George F. Kirchoff, and Fred E. Schneiter, both of Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Dec. 18, 1978, Ser. No. 970,602
Int. Cl.[2] C06B 35/00
U.S. Cl. 149—35 7 Claims

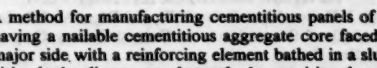
1. A solid nitrogen gas generant consisting of 60 to 80 weight percent alkali metal azide, 2 to 35 weight percent oxide selected from the group consisting of iron oxide, cobalt oxide, nickel oxide, palladium oxide, silicon oxide and mixtures thereof, 2 to 26 weight percent molybdenum disulfide and up to 6 weight percent sulfur.

4,203,788

METHODS FOR MANUFACTURING CEMENTITIOUS REINFORCED PANELS

Theodore E. Clear, 903 Harrison Ave., Hamilton, Ohio 45013

Filed Mar. 16, 1978, Ser. No. 887,324
Int. Cl.[2] B32B 31/12, 13/14; B28B 1/08
U.S. Cl. 156—44 32 Claims



1. A method for manufacturing cementitious panels of the type having a nailable cementitious aggregate core faced on each major side with a reinforcing element bathed in a slurry comprising hydraulic cement, the method comprising the steps of:

running an elongated indefinite length web of pervious reinforcing material through a slurry bath and depositing an amount of slurry thereto to form a first wet uncured flexible cementitious element;

depositing cementitious aggregate core material on said uncured flexible cementitious element;

running a second elongated indefinite length web of pervious reinforcing material through a second slurry bath, and depositing an amount of slurry thereto to form a second wet uncured flexible cementitious element;

laying the second element on said core material;

thereby adhering the elements to respective major sides of said aggregate core material to form an uncured panel web;

thereafter cutting said uncured panel web to form separate

uncured cementitious panels; and thereafter curing said panels.

4,203,789

PROCESS FOR REPRODUCING PICTORIAL WORKS AND WORKS ACHIEVED WITH SAID PROCESS

Gérard L. Y. Delorme, 10 boulevard Suchet, Paris, France

Filed Sep. 26, 1977, Ser. No. 836,845
Int. Cl.[2] B44C *3/00*; G03C *5/04, 5/00*
U.S. Cl. 156—59 12 Claims

1. A process for reproducing a pictorial work such as a painting on a support comprising:

producing a flat copy of said pictorial work;

projecting an image of saif flat copy onto the support;

applying touches of a hardenable pasty mass to portions of said support to construct imitation relief portions coinciding with relief portions of the pictorial work shown in said image;

allowing the touches of pasty mass to harden on said support; and

applying said flat copy to the support so that the relief portions of the pictorial work shown in the flat copy coincide with the imitation relief portions on the support.

4,203,790

METHOD OF FORMING WIRE REINFORCED CORRUGATED BOARD

Marc A. Chavannes, 4044 Roberts Point, Sarasota, Fla. 33581

Filed Jul. 25, 1975, Ser. No. 599,142
Int. Cl.[2] B31F *1/24*
U.S. Cl. 156—179 10 Claims

1. The method of manufacturing wire reinforced corrugated board for packaging comprising the steps of feeding a paper web with an adhesive applied to an outer surface of said web, feeding a plurality of spaced parallel longitudinal wires onto the adhesive coated paper web, setting the wires in firm contact with said web to form a wire reinforced paper web, then corrugating said wire reinforced web transversely of said wires, and adhesively securing a paper web to the crest portions on each side of the corrugated wire reinforced web to form a double faced wire reinforced corrugated board.

4,203,791

METHOD OF MAKING A MULTI-SLIT SELF-SEALING IGNITION-ARRESTER BATTERY VENT

Joseph I. Heiser, Wyomissing Hills, and Edgar M. Erb, Lancaster, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Division of Ser. No. 744,647, Nov. 24, 1976, Pat. No. 4,086,395, which is a continuation-in-part of Ser. No. 593,546, Jul. 7, 1975, abandoned. This application Feb. 21, 1978, Ser. No. 879,461
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—252 2 Claims

1. A method of producing an ignition arresting battery vent for use on electric storage batteries to sealingly engage one or more openings of said battery and to vent battery gases to the atmosphere, comprising the steps of:

(a) providing a substantially hollow battery cap having means to sealingly engage one or more of said openings;

(b) creating a plurality of slits in at least one exterior surface of said vent cap, each of said slits having a width of about 0.004 to 0.005 inches and for providing fluid communication between the interior of said battery cap and the atmosphere, the depth, length and number of said plurality of slits being selected such that at least 1.5 psig of air pressure

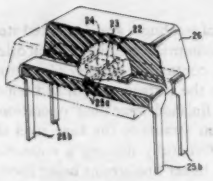
is required to move 2⅞ standard cubic feet per hour per cell of air through said slits.

4,203,792

METHOD FOR THE FABRICATION OF DEVICES INCLUDING POLYMERIC MATERIALS

Larry F. Thompson, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 17, 1977, Ser. No. 852,504
Int. Cl.[2] B29C *19/02*; B05D *3/06, 5/12*
U.S. Cl. 156—272 12 Claims



1. A method of semiconductor device fabrication comprising

(a) forming a mixture of a thermally curable polymeric material and an effective amount of thermal initiator to bring about substantially complete reaction of the polymeric material upon thermally curing the mixture,

(b) dispensing a quantity of the mixture onto a support member, which quantity has an unconfined dome-shaped surface, and

(c) thermally curing the mixture characterized in that the mixture additionally contains at least effective amounts of a radiatively curable polymer additive and a radiation initiator additive, and further characterized in that prior to thermally curing the quantity of polymeric material it is exposed to actinic radiation, whereby the radiatively curable polymer is cured, resulting in a gelling of the quantity and the persisting of the quantity's dome-shaped surface during the following thermal cure.

4,203,793

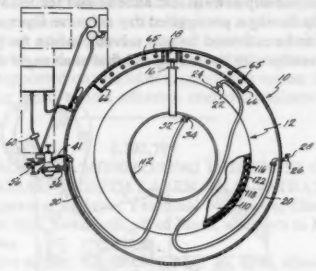
PRESSURE VESSEL SYSTEM FOR RETREADING TIRES

Edwin T. Brodie, and Donaldee Brewer, both of Muscatine, Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

Division of Ser. No. 622,419, Oct. 14, 1975, Pat. No. 4,075,047. This application Jan. 6, 1978, Ser. No. 867,611
Int. Cl.[2] B29H *17/36*
U.S. Cl. 156—394 6 Claims

1. Apparatus for bonding a precured tread strip to a tire by means of a vulcanizable bonding material interposed between the tread strip and the tire, said apparatus comprising: a vessel for receiving a tire and tread assembly; pressure fluid conduit means having an inlet for receiving pressure fluid from a source thereof, said conduit means including a first pressure regulator and a manifold connected to said first pressure regulator to receive pressure fluid therefrom; means for passing

pressure fluid from said manifold to the interior of said vessel, said means including in flow sequence a differential pressure check valve and a second pressure regulator; and a tire-inflating conduit connected to said manifold, said inflating conduit having an end located in said vessel and connectable to the interior of a tire in said vessel, the arrangement of said pressure



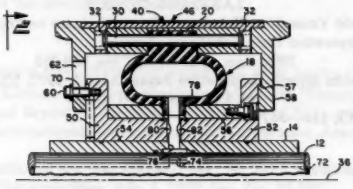
regulators and said pressure differential check valve being such that during pressurization of said manifold by way of said first pressure regulator, the pressure fluid flows simultaneously from said manifold to said inflating conduit and to said vessel and such that thereafter the pressure in said vessel is maintained at a lower value than the pressure in said inflating conduit.

4,203,794

VARIABLE WIDTH TIRE BUILDING DRUM WITH INTERDIGITATED SHOES

Marcus H. Collins, Akron, and John K. Smith, Parma, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 25, 1978, Ser. No. 954,516
Int. Cl.[2] B29H *17/16*
U.S. Cl. 156—415 **18 Claims**



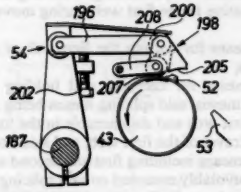
1. An annular tire building drum having an infinitely variable width for use in a tire building machine for building portions of tires having variable widths comprising a hub portion supportable for rotation in the tire building machine about an axis of rotation, an annular fluid expandable tube element supported on said hub portion, support means disposed on an exterior surface of said tube element for movement therewith, a plurality of pairs of shoe members supported by said support means for movement therewith in a radial direction upon expansion and contraction of said tube element, said shoe members cooperating to define an annular tire building surface which is movable in a radial direction upon expansion and contraction of said tube element, one of said shoe members of each of said plurality of pairs of shoe members being movable in a first direction parallel to said axis of rotation and the other of said shoe members of said plurality of pairs of shoe members being movable in a second direction opposite to said first direction to infinitely vary the axial width of the building surface to enable various width tires to be built thereon, said support means including guideway means disposed thereon, each of said shoe members including a guide member attached thereto for movement therewith, said guide members being received in said guideway means and cooperating therewith to prevent movement of said shoe members in a radial direction relative to said support means and the exterior surface of the tube element and providing for relative movement in a direction parallel to said axis of rotation between said shoe members and said support means to thereby infinitely vary the width of said tire building surface.

4,203,795

MACHINE FOR THE MANUFACTURE OF PACKING CONTAINERS

Herwig Pupp, and Birger O. Andersson, both of Lund, Sweden, assignors to AB Ziristor, Lund, Sweden

Division of Ser. No. 720,516, Sep. 3, 1976, Pat. No. 4,077,829.
This application Feb. 27, 1978, Ser. No. 881,604
Claims priority, application Sweden, Sep. 10, 1975, 7510092
Int. Cl.[2] B29D *23/00*
U.S. Cl. 156—446 **12 Claims**



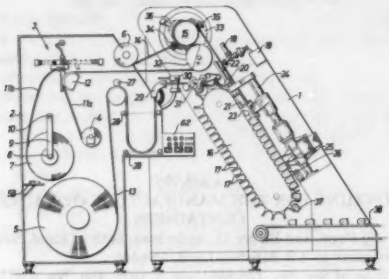
1. In a machine for the manufacture of packing containers of a heat shrinkable thermoplastic web material having a mandrel rotatable about its axis, means for intermittently rotating said mandrel, means for intermittently feeding a web of the material to the rotatable mandrel, means for rotating the mandrel to wrap a blank of the material about the mandrel to form a sleeve-shaped shell having overlapping opposed edges and means for heat sealing the overlapping opposed edges of the blank together, the improvement comprising roller means for pressing the blank against the mandrel while said blank is being wrapped thereabout, pressure means for pressing together the overlapping edges of the blank when the edges are heat sealed together, means for sequentially (1) pressing only said roller means against the blank while it is being wrapped about the mandrel to form the shell, (2) pressing said roller means and said pressure means against the shell during heat sealing of the overlapping opposed edges, and (3) withdrawing said roller means and said pressure means from the shell on the mandrel after heat sealing the overlapping opposed edges wherein said means for sequentially operating said roller means and said pressure means comprises a shaft for supporting both said roller means and said pressure means and disposed axially parallel to the axis of the mandrel, said means for sequentially operating said roller means and said pressure means further comprising means for intermittently rotating said shaft on its axis in opposite directions and said means for sequentially operating said roller means and said pressure means further comprising linkage means connecting said shaft both to said roller means and to said pressure means for sequentially operating said roller means and said pressure means when said shaft is intermittently rotated in opposite directions.

4,203,796

ARRANGEMENT FOR JOINING MATERIAL WEBS

Tore I. Larsson, Löddeköpinge, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Apr. 24, 1978, Ser. No. 899,526
Claims priority, application Sweden, Apr. 22, 1977, 7704647
Int. Cl.[2] B65H *19/08*
U.S. Cl. 156—504 5 Claims



1. An apparatus for joining a first web of material with a second web of material comprising:

means for longitudinally advancing the first web;

holding means for positioning a starting end of the second web relative to the first web during movement of the first web;

cutting means for cutting the first web at a predetermined location;

splicing means for carrying said holding means and said cutting means, said splicing means being located adjacent to the first web and displaceable in the longitudinal direction of travel of the first web, and said holding means and cutting means including first and second members, respectively, pivotably mounted on said splicing means such that said members having corresponding and cooperating cutting edges which sever the first web at a predetermined location upon pivoting the second member; and

means for synchronizing the displacement of said splicing means with the longitudinal advancement of the first web, said synchronizing means including a stationary cam surface with a follower member carried by said cutting means, said follower member engaging the cam surface during a pivoting of said pivotably mounted member of the cutting means.

5. The apparatus of claim 1 further comprising actuating means for driving said cutting means, said actuating means being adapted to engage said cam surface with said follower member to synchronize the position of the splicing means with the first web.

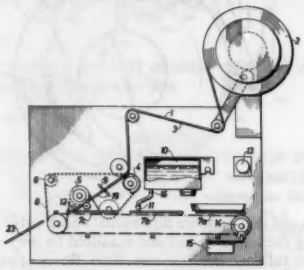
4,203,797

METHOD OF AND APPARATUS FOR APPLYING COVER-SLIPS TO SLIDES CARRYING SPECIMENS FOR MICROSCOPIC EXAMINATION

Nils G. Stormby, Malmö, Sweden, assignor to Cytologiska Centrallaboratoriet AB, Sweden

Division of Ser. No. 795,007, May 9, 1977, Pat. No. 4,146,414.
This application Sep. 29, 1978, Ser. No. 947,028
Int. Cl.[2] A01N *1/00*; G02B *21/34*; A01N *1/00*
U.S. Cl. 156—521 4 Claims

1. An apparatus for forming a composite assembly of a discrete slide provided with a specimen for microscopic examination and a cover-slip comprising means for transporting a slide having the specimen thereon in a horizontal plane past at least a first and second station, means for positioning a nozzle which dispenses liquid solvent adjacent the surface of the leading end of said slide, means for depositing said solvent directly on said slide and for forming a small but restricted liquid excess swelling thereon, means for partially raising said nozzle from said slide, means for moving said slide through said first station and forming a liquid solvent film on said slide, means for interrupting the formation of the film immediately before the opposite end of the slide passes the nozzle, means for transporting said slide with solvent to said second station, means for feeding a flexible cover-slip toward said slide at said second station, said cover-slip having a pre-applied dry adhesive layer on one side adapted to be activated by said solvent, means for positioning said cover-slip with its leading end first at an angle to said slide



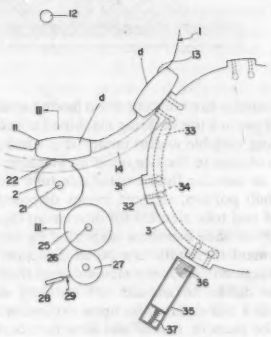
while said slide is transported past said second station, means for transporting said slide past said second station at a speed substantially equal to the feeding of said cover slip, means for positioning a roller distinct from said slide and said cover-slip at a predetermined distance above said slide thereby to form an excess of solvent in the angle between the cover slip and the slide and means for simultaneously pressing said cover-slip to said slide from the leading end to the trailing end thereof so as to squeeze any excess solvent and air from between said cover-slip and said slide, and thus from said composite assembly.

4,203,798

LABELING DEVICE

Kyoichi Yamashita, Yokohama, Japan, assignor to Koyo Jidoki Corporation Ltd., Yokohama, Japan

Filed Aug. 3, 1978, Ser. No. 930,755
Claims priority, application Japan, Aug. 3, 1977, 52/93655
Int. Cl.[2] B65C *9/00*, *11/04*
U.S. Cl. 156—567 4 Claims



1. In a labeling device of the type comprising:

a rotatable container transfer drum means for transferring containers onto which labels are to be affixed;

an adhesive coating drum means for applying an adhesive material; and

a label supply drum means for first holding labels and then releasing them, said label supply drum means comprising

a drum having protrusions spaced along its periphery, suction outlets to ports on the surface of said protrusions, and valve means for alternately applying and releasing suction applied to said suction ports, thereby first gripping and then releasing said labels;

wherein the improvement comprises contacting the containers carried by said rotatable container transfer drum means with said adhesive coating drum means, thereby applying adhesive to said containers and subsequently contacting said adhesive coated containers while still carried by said container transfer drum means to said labels supported on said label supply drum means, thereby applying labels to said adhesive coated containers.

4,203,799

METHOD FOR MONITORING THICKNESS OF EPITAXIAL GROWTH LAYER ON SUBSTRATE

Katsuro Sugawara, Kodaira; Yukiyoshi Nakazawa, Ohme, and Katsuhiko Itoh, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 690,304, May 26, 1976, abandoned. This application May 2, 1978, Ser. No. 902,033

Claims priority, application Japan, May 30, 1975, 50/64317

Int. Cl.[2] B01J *17/30, 17/32, 17/40;* G01B *19/38*

U.S. Cl. 156—601 10 Claims

1. A method for monitoring thickness of a homoepitaxial growth layer, comprising the steps of:

(a) implanting ions into an original substrate to a predetermined depth from a major surface so as to form within the substrate below said major surface a layer of substance having an optical property different from that of the substance of the original substrate;

(b) growing on said major surface of the original substrate a homoepitaxial layer having substantially the same optical properties as the original substrate;

(c) receiving light from the original substrate and from the surface of the implanted layer at the time of growth of the epitaxial layer in the form of an interference waveform; and

(d) monitoring thickness of an epitaxial growth layer by the use of the interference waveform.

4,203,800

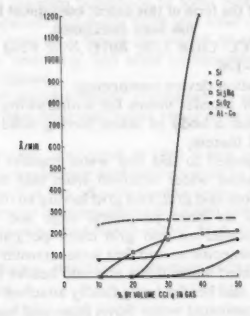
REACTIVE ION ETCHING PROCESS FOR METALS

James R. Kitcher, Poughkeepsie; Gunars M. Ozols, Wappingers Falls, and Bryant N. Zingerman, Monroe, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 866,087, Dec. 30, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,801

Int. Cl.[2] H01L *21/44, 21/465*

U.S. Cl. 156—643 11 Claims



1. A process for removing a metal layer from a workpiece which includes silicon, without significant etching of silicon which is exposed to the etching gas plasma for the metal layer, comprising placing the workpiece having a metal layer which is selected from the group consisting of chromium, titanium, tungsten, tantalum and alloys thereof, on a first electrode in a chamber and subjecting the metal layer to a glow discharge formed by electrically biasing the first electrode relative to a second electrode, in a low pressure ambient atmosphere comprising a gaseous mixture of from about 5 to about 20 percent by volume of a polychlorinated organic compound containing one to two carbon atoms and about 80 to about 95 percent by volume of oxygen, said ambient atmosphere having a pressure in the range of about 5 to 50 milli-torr.

4,203,801

CELL AND VIRUS CULTURE SYSTEMS

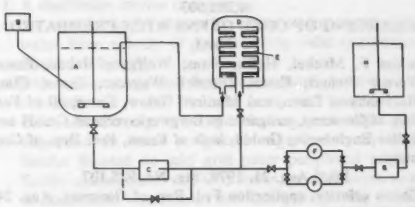
Ronald C. Telling, Woking; Roy J. Passingham, Fleet; Brian L. Kitchener, and David G. Hopkinson, both of Farnborough, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 670,448, Mar. 25, 1976, Pat. No. 4,085,203, and Ser. No. 354,195, Apr. 25, 1973, abandoned. This application Apr. 1, 1977, Ser. No. 783,660

Claims priority, application United Kingdom, Apr. 26, 1972, 19387/72

Int. Cl.[2] C12K *9/00;* C12B *3/00;* C12K *5/00*

U.S. Cl. 435—284 21 Claims



1. A cell culture system which comprises living eucaryotic cells of human or animal origin, or mycophyta, dispersed within a porous carrier bed, said carrier bed comprising particulate material, and a support means for said carrier bed, said particulate material providing sufficient internal cavities or spaces for retaining and permitting said cells to grow and multiply within said carrier bed, and said support means allowing liquid media to pass through and out of said carrier bed and to have contact with said cells.

4,203,802

INHIBITABLE ENZYME AMPLIFICATION ASSAY

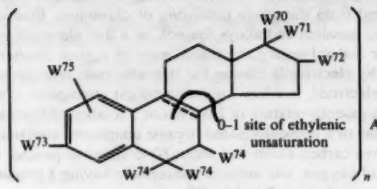
Kenneth E. Rubenstein, Menlo Park, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774, which is a continuation of Ser. No. 481,022, Jun. 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 802,683, Jun. 2, 1977, Pat. No. 4,190,496, which is a continuation of Ser. No. 760,499, Jan. 19, 1977, which is a continuation of Ser. No. 722,964, Sep. 13, 1976. This application Dec. 5, 1977, Ser. No. 857,145

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—188 6 Claims

1. An enzyme-bound-ligand of the formula:



wherein:

any one of the W groups can be $-X^{\bullet}$ or an H of any of the W groups may be replaced by $-X^{\bullet}$, wherein $-X^{\bullet}$ is a bond or a linking group;

$A^{\bullet}$ is an enzyme bonded at other than its reactive site, having n ligands, wherein n is in the range of 1 to the molecular weight of $A^{\bullet}$ divided by 2,000;

W^{70} and W^{71} are hydrogen, hydroxyl, or ethinyl, there being only one ethinyl;

W^{72} is hydrogen or hydroxyl;

W^{73} is hydroxyl or alkoxyl of from 1 to 3 carbon atoms;

W^{74} is hydrogen, or two W^{74}'s may be taken together to form a double bond; and

W^{75} is hydrogen.

4,203,803

CHARGING OF COKE OVENS WITH PREHEATED COAL

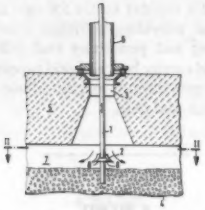
Joachim F. Meckel, Heiligenhaus; Wolfgang Rohde, Essen; Werner Siebert, Essen; Dietrich Wagener, Essen; Claus Flockenhaus, Essen, and Manfred Galow, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,107

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738094

Int. Cl.² C10B *31/04*

U.S. Cl. 201—40 **2 Claims**



1. A method of charging a coke oven chamber, comprising the steps of advancing preheated particulate coal by a conveyor to a coke oven chamber; charging the chamber by admitting through a single charging hole in the top of the chamber a stream of the preheated particulate coal at a charging rate of substantially 8–20 t/min; intercepting only a minor fraction of the stream of coal below the charging hole; and imparting to the intercepted fraction of the stream of coal a component of movement diverting the intercepted fraction toward the respective ends of the chamber whereby, due to the flowability of the preheated coal particles and the diversion of the intercepted fraction, the chamber becomes charged to a uniform permissible filling level at substantially 100% of its volumetric capacity.

4,203,804

APPARATUS FOR THE PYROLYSIS OF PIECES OF RUBBER OR LIKE MATERIAL, ESPECIALLY USED MOTOR VEHICLE TIRES

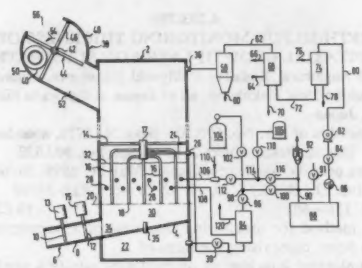
Jörg Janning, Hamburg; Walter Kaminsky, Pinneberg; Hansjörg Sinn, Norderstedt, and Stanislav Tysarcyk, Hamburg, all of Fed. Rep. of Germany, assignors to Carl Robert Eckelmann AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,294

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658371

Int. Cl.² C10B *1/04, 53/00*

U.S. Cl. 202—121 **20 Claims**



1. A fluidized bed reactor for the pyrolysis of pieces of material of rubber and the like, comprising a reactor container which includes a bottom associated with an outlet arrangement for non-vaporizable pyrolysis products, said bottom and said outlet arrangement being arranged in a lower part of the container, an arrangement of blowing orifices for introducing fluidizing gas and producing a fluidized bed from a filled-in fire-resistant and inert finely granular fluidized bed material, said blowing orifices being arranged in a region above the bottom with a downward blowing direction, at least on group of the blowing orifices being arranged in a common horizontal plane, a gas outlet, and a feeding device for introducing pieces of material to be pyrolyzed, said inert fluidized bed material having a particle size below 1 mm, said gas outlet and said feeding device being arranged in an upper part of the container, and said feeding device and fluidized bed being dimensioned for the introduction and pyrolysis of pieces having the size of whole automobile tires.

4,203,805

APPARATUS FOR DESALINATING WATER

Richard E. Diggs, 12A Road, Carthage, Mich. 64836

Division of Ser. No. 625,850, Oct. 28, 1975, Pat. No. 4,118,283. This application Jan. 12, 1978, Ser. No. 868,975

The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.

Int. Cl.² C02B *1/04*; B01D *3/10*; F24J *3/02*

U.S. Cl. 202—176 **5 Claims**

1. A distillation device comprising:

a first water transfer means for withdrawing contaminated water from a body of water having solid contaminants dissolved therein;

a grid connected to said first water transfer means so that contaminated water received from said body of water flows across said grid, said grid having an outer peripheral edge and an inner peripheral edge and comprising a header located on said grid outer peripheral edge and fluidly connected to said first water transfer means so that contaminated water flows into said header from the body of water, said header being fluidly attached to said grid so that contaminated water flows from said header onto said grid whereby contaminated water flows from the body of water to said grid via said header, and a trough located on said grid inner peripheral edge and fluidly attached to said

grid so that contaminated water flows into said trough from said grid, and means for transferring solar energy to said water flowing across said grid;

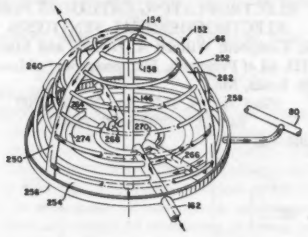
a water storage means having a side wall attached to said grid trough so that contaminated water flowing on said grid flows into said water storage means via said trough;

second water transfer means connected with said water storage means for removing contaminated water from said storage means;

a third water transfer means located in said trough and connected to said water storage means for transferring water from said trough to said water storage means and temperature control means connected to said third water transfer means for actuating said third water transfer means when the temperature of said water in said trough reaches or exceeds said predetermined temperature so that only water having a temperature which equals or exceeds said predetermined temperature is transferred to said water storage means;

a heat exchange structure connected to said water storage means;

a recirculation apparatus mounted in said trough and connected to said header for recirculating said water from said trough back to said header prior to transferring water from said trough into said water storage means and temperature control means connected to said recirculation apparatus for actuating said apparatus when the temperature of said water in said trough falls below a predetermined temperature;



a vaporizer means connected to said heat exchange structure for separating said water from said solid contaminants dissolved therein, said vaporizer means having a solar concentrator means for transferring solar energy to said contaminated water flowing from said heat exchange structure into said vaporizer means;

vacuum producing means for producing a vacuum in said vaporizer means so that said contaminated water is vaporized under vacuum conditions to form water vapor and thereby separate said water from said solid contaminants, and solid removing means connected to said vaporizer means for removing said solid contaminants from said vaporizer means;

water vapor transfer means connected to said vaporizer means for removing said water vapor from said vaporizer means;

condenser means connected to said water vapor transfer means for condensing said water vapor to form distilled water which is free of solid contaminants; and

distillate transfer means connected to said condenser means for withdrawing condensed water from said condenser means; and

a heat exchange structure, said heat exchange structure comprising:

a base;

a wall mounted on said base;

a piping system located adjacent said wall and connected to said base for containing water to be used in the distillation device, said piping system comprising upright pipes and interconnecting pipes for transferring water between said interconnecting pipes;

means for transferring said water into said pipes; and

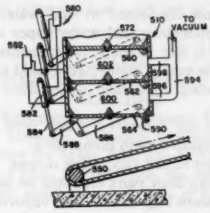
means for collecting water located at the bottom of said structure.

4,203,806

APPARATUS FOR DESALINATING WATER

Richard E. Diggs, 12A Rd., Carthage, Mo. 64836

Division of Ser. No. 625,850, Oct. 28, 1975, Pat. No. 4,118,283.
This application Jan. 12, 1978, Ser. No. 869,005
The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.
Int. Cl.[2] C02B *1/04;* B01D *3/10*
U.S. Cl. 202—176 **6 Claims**



1. A distillation device comprising:

a first water transfer means for withdrawing contaminated water from a body of water having solid contaminants dissolved therein;

a grid connected to said first water transfer means so that contaminated water received from said body of water flows across said grid, said grid having an outer peripheral edge and an inner peripheral edge and comprising a header located on said grid outer peripheral edge and fluidly connected to said first water transfer means so that contaminated water flows into said header from the body of water, said header being fluidly attached to said grid so that contaminated water flows from said header onto said grid whereby contaminated water flows from the body of water to said grid via said header, and a trough located on said grid inner peripheral edge and fluidly attached to said grid so that contaminated water flows into said trough from said grid, and means for transferring solar energy to said water flowing across said grid;

a water storage means having a side wall attached to said grid trough so that contaminated water flowing on said grid flows into said water storage means via said trough;

second water transfer means connected with said water storage means for removing contaminated water from said storage means;

a third water transfer means located in said trough and connected to said water storage means for transferring water from said trough to said water storage means and temperature control means connected to said third water transfer means for actuating said third water transfer means when the temperature of said water in said trough reaches or exceeds said predetermined temperature so that only water having a temperature which equals or exceeds said predetermined temperature is transferred to said water storage means;

a heat exchange structure connected to said water storage means;

a recirculation apparatus mounted in said trough and connected to said header for recirculating said water from said trough back to said header prior to transferring water from said trough into said water storage means and temperature control means connected to said recirculation apparatus for actuating said apparatus when the tempera-

ture of said water in said trough falls below a predetermined temperature;

a vaporizer means connected to said heat exchange structure for separating said water from said solid contaminants dissolved therein, said vaporizer means having a solar concentrator means for transferring solar energy to said contaminated water flowing from said heat exchange structure into said vaporizer means;

vacuum producing means for producing a vacuum in said vaporizer means so that said contaminated water is vaporized under vacuum conditions to form water vapor and thereby separate said water from said solid contaminants, and solid removing means connected to said vaporizer means for removing said solid contaminants from said vaporizer means;

water vapor transfer means connected to said vaporizer means for removing said water vapor from said vaporizer means;

condenser means connected to said water vapor transfer means for condensing said water vapor to form distilled water which is free of solid contaminants; and

distillate transfer means connected to said condenser means for withdrawing condensed water from said condenser means; and

a dump system for removing solids from the vaporizing means, said dump system comprising:

a casing attached to the vaporizing means;

a plurality of trap door pairs mounted on said casing and a vaporizing means trap door in said vaporizing means, said vaporizing means trap door located adjacent a first pair of said plurality of pairs of trap doors for dumping solids from the vaporizing means onto said first pair of trap doors, said trap door pairs being spaced from one another to define therebetween a plurality of chambers and aligned with each other for moving solid material from one pair of trap doors to the next; and

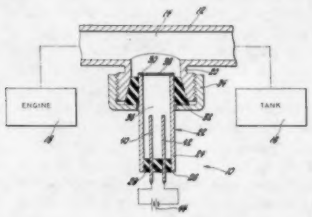
trap door moving means mounted on said casing for selectively opening and closing said trap doors.

4,203,807

ON-BOARD DETECTION OF ANTIKNOCK COMPOUNDS IN AUTOMOTIVE GASOLINE

Jeffrey C. Buchholz, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1979, Ser. No. 22,337
Int. Cl.[2] G01N *27/26*
U.S. Cl. 204—1 T **9 Claims**



1. A method for detecting the presence of a lead or manganese organometallic compound in an automotive gasoline sample, said method comprising

assembling an electrochemical cell comprising an anode, a cathode spaced apart from the anode, and an electrolyte contacting the anode and the cathode, said electrolyte comprising water, a soluble inorganic hydroxide and an alcohol taken from the group consisting of methanol, ethanol and mixtures thereof, said electrolyte being substantially immiscible with gasoline, but capable of extracting said organometallic compounds from gasoline containing said compounds,

contacting the sample with the electrolyte and thereby extracting said organometallic compound into said electrolyte,

applying an electrical potential to the anode and cathode, said potential being suitable to deposit the metallic constituent of said compound onto said cathode, and

determining the presence of said metallic deposit on the cathode.

6. An electrochemical device for detecting the presence of an organometallic compound comprising tetraalkyl lead compound or methylcyclopentadienyl manganese tricarbonyl compound in an automotive gasoline sample, said device comprising

an electrolyte adaptable to contact said gasoline sample and comprising a hydroxide ion-containing methanol solution, said electrolyte being substantially immiscible with gasoline and capable of extracting the organometallic compound from gasoline,

an anode immersed in said electrolyte,

a cathode immersed in said electrolyte and spaced apart from said anode, and

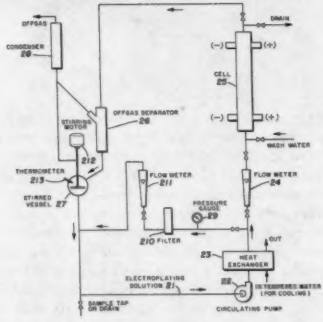
means for connecting the anode and the cathode to an electrical power source for applying an electrical potential thereto.

4,203,808

ELECTROPLATING CATHODES FOR ELECTROCHEMICAL SYNTHESIS

Charles R. Campbell; William A. Heckle, and Marion J. Mathews, III, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 14, 1976, Ser. No. 705,307
Int. Cl.[2] C25D *5/00, 21/00*
U.S. Cl. 204—23 **12 Claims**



1. In a method for production of an undivided electrolytic cell for electrochemical reduction of organic compounds having in permanently fixed and substantially parallel planar relationship electrodes comprising anodes and cathodes at least a portion of which cathodes are metal-plated the metal plating constituting the cathode surface wherein cathode substrates are electroplated and thereafter assembled and permanently fixed in said substantially parallel planar relationship, the improvement comprising assembling the anodes and cathode substrates in said substantially parallel planar relationship as a package and thereafter electroplating the cathode substrates while in package form by applying an electric potential between said anodes and cathode substrates in an electroplating solution containing the plating metal in complex form, said anodes functioning as nonsacrificial anodes during electroplating.

4,203,809

COPPER FOIL HYPOCHLORITE TREATMENT METHOD AND PRODUCT PRODUCED

Walter A. McKean, 116 Meredith Rd., Colonia, N.J. 07067

Continuation of Ser. No. 40,832, May 27, 1970, abandoned. This application Mar. 4, 1975, Ser. No. 555,180

Int. Cl.[2] C25D 5/32; C23F 1/00

U.S. Cl. 204—32 R 16 Claims

1. A process for improving the surface characteristics of copper foil comprising subjecting said foil to an aqueous sodium hypochlorite solution for a period of from about 5 to 30 seconds, said solution containing from about 2½ to 15% sodium hypochlorite and being maintained at a temperature of from about 110°–160° F.

15. A process for improving the surface characteristics of copper foil comprising subjecting said foil to an aqueous sodium hypochlorite solution and then subjecting said foil to an electrochemical treatment to coat at least one of its faces with a microcrystalline, powdery electrodeposit so as to improve its bond strength.

4,203,810

ELECTROLYTIC PROCESS EMPLOYING ELECTRODES HAVING COATINGS WHICH COMPRISE PLATINUM

Michael A. Warne, Brewood, and Peter C. S. Hayfield, Bickenhill, both of England, assignors to IMI Marston Limited, Staffordshire, England

Division of Ser. No. 540,384, Jan. 13, 1975, which is a continuation of Ser. No. 371,727, Jun. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 125,956, Mar. 19, 1971, abandoned. This application Nov. 11, 1976, Ser. No. 741,107

Claims priority, application United Kingdom, Mar. 25, 1970, 14417/70

Int. Cl.[2] C25D 5/38, 5/42, 5/50

U.S. Cl. 204—38 B 10 Claims

1. A method of carrying out an electrolytic process, which comprises inserting in an electrolyte, an electrode, connecting said electrode to a positive potential with respect to a cathode in said electrolyte, said electrode being manufactured by taking an electrode substrate of titanium, tantalum or niobium or an alloy based on at least one of these metals, applying thereto at least one chemical compound containing platinum or an alloy thereof and capable of decomposing upon firing to provide an underlayer contaning platinum or an alloy thereof, firing the coating at a temperature in the range 200°–550° C. to produce such an underlayer and, subsequently, without heating to higher temperatures, electroplating at least one precious metal onto said underlayer.

4,203,811

PROCESS FOR THE MANUFACTURE OF p-BENZOQUINONE-DIKETALS

Jürgen Cramer, Eppstein am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

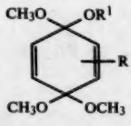
Filed Aug. 30, 1978, Ser. No. 938,043

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739316

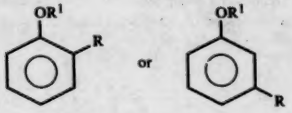
Int. Cl.[2] C25B 3/02; C07C 41/00

U.S. Cl. 204—78 8 Claims

1. In a process for the preparation of p-benzoquinone diketals of the formula



wherein R is hydrogen, an alkyl group having from 1 to 4 carbon atoms or halogen, and R^1 is an alkyl group having from 1 to 4 carbon atoms, by anodically oxidizing benzene or an alkoxybenzene of the formula



wherein R and R^1 are as defined above, in a methanolic solution containing less than about 5% by weight of water in the presence of at least one alkali metal fluoride, ammonium fluoride and/or phosphonium fluoride as a supporting electrolyte, the improvement which comprises the addition of hydrogen fluoride in an amount sufficient to conduct the anodic oxidation in a medium maintained at a pH below 7.

4,203,812

PROCESS FOR PREPARING BASIC ALUMINUM CHLORIDES

Dieter Bergner, Kelkheim, and Max Danner, Gersthofen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 23, 1978, Ser. No. 889,334

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713236

Int. Cl.[2] C25B 1/26, 11/10

U.S. Cl. 204—94 6 Claims

1. A process for preparing aqueous solutions of basic aluminum chloride of the formula $Al_2(OH)_nCl_z$, wherein n is a number from 1 to 5.3 and z is a number from 5 to 0.66 and the sum of n+z is always 6, by electrolysis of an aqueous solution of aluminium chloride or of a basic aluminium chloride of lower basicity, at temperatures of from 50° to 120° C. and current densities of from 200 to 4000 A/M^2, which process comprises subjecting the said aluminium salt solutions between a cathode of graphite, of a platinum metal, or of a material coated with a platinum metal, and an anode having a core of titanium or a titanium alloy and a coating on said core of at least one metal of the platinum group, of at least one oxide of a metal of the platinum group, or of a mixture thereof, without the use of a diaphragm, to electrolysis until a basic chloride of the desired stoichiometric composition has formed.

4,203,813

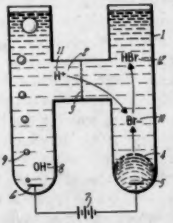
METHOD FOR PRODUCING HBR

Daniel H. Grantham, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 1, 1978, Ser. No. 956,761

Int. Cl.[2] C25B 1/22, 1/24

U.S. Cl. 204—103 10 Claims



1. In the production of hydrogen bromide in an electrolytic cell having anode and cathode containing compartments separated by hydrogen ion permeable membrane and containing an aqueous electrolyte solution, by causing current to flow from

the anode to the cathode with the accompanying ion transport through the hydrogen ion permeable membrane, the improvement comprising:

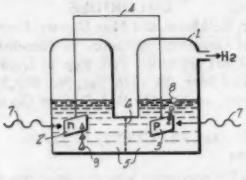
utilizing as the cathode a metal electrode surrounded by liquid bromine having dissolved therein bromide ions in an amount sufficient to conduct charge through the liquid bromine.

4,203,814

HYDROGEN GAS GENERATION UTILIZING A BROMIDE ELECTROLYTE AND RADIANT ENERGY

Daniel H. Grantham, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 1, 1978, Ser. No. 956,760
Int. Cl.² C25B *1/02, 1/00*
U.S. Cl. 204—129 **12 Claims**



1. A process for producing hydrogen gas from an electrolyte solution in an electrolytic cell, wherein the improvement comprises utilizing a solution of a bromide compound as the electrolyte in conjunction with radiant energy and a semiconducting silicon electrode to at least partially power the electrolytic cell.

4,203,815

PROCESS FOR PRODUCING CROSSLINKED AND FOAMED RESIN SHEET

Yoichiro Noda, Ohtone; Michio Matsumura, Saitama; Norio Chiba, and Masahito Hata, both of Hasuda, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 14, 1978, Ser. No. 886,580
Int. Cl.² B01J *1/10;* B29D *27/00*
U.S. Cl. 204—159.2 **14 Claims**

1. A process for producing a crosslinked and foamed resin sheet which comprises shaping a resinous mixture comprising a thermoplastic synthetic resin and a heat-decomposable blowing agent into a sheet form, applying high-energy and low-energy ionizing radiation to the resulting foamable resin sheet to crosslink the resin sheet, and then heating the resulting crosslinked foamable resin sheet to a temperature at which the blowing agent decomposes, wherein the high-energy ionizing radiation is at least 0.7 ρd g/cm^2 in which d is the thickness of cm of the foamable resin sheet, and ρ is the density in g/cm^3 of the foamable resin sheet, and wherein the low-energy ionizing radiation is not more than 0.6 ρd g/cm^2 in which d and ρ are as defined, and the low-energy ionizing radiation is applied to the foamable resin sheet before, during or after the application of the high-energy ionizing radiation and before heating the resulting cross-linked foamable resin sheet.

14. A crosslinked and foamed resin sheet produced by the process of claim **1**.

4,203,816

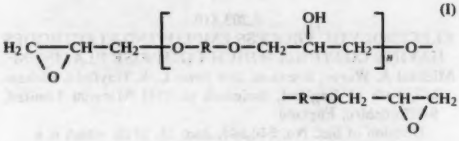
COMPOSITIONS HARDENABLE BY UV RADIATION COMPRISING AN UNSATURATED EPOXY RESIN ESTER AND AN UNSATURATED MONOMER

Silvio Vargiu, Casatenovo; Edoardo Carpaneti, Sovico, and Beppino Passalenti, Lissone, all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

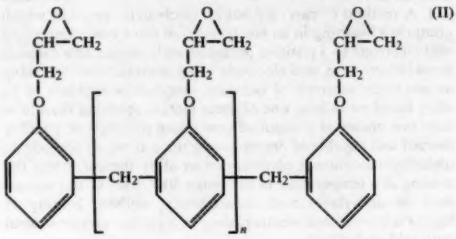
Continuation of Ser. No. 894,319, Apr. 7, 1978, abandoned. This application May 11, 1979, Ser. No. 38,160
Claims priority, application Italy, Apr. 7, 1977, 22183 A/77
Int. Cl.² C08G *18/00, 63/00*
U.S. Cl. 204—159.16 **7 Claims**

1. A composition hardenable by means of ultra-violet radiations, which comprises:

(a) an unsaturated epoxy resin ester which is a reaction product prepared by a process consisting essentially of reacting an epoxy resin



wherein R is the divalent radical of a dephenol HO-R-OH and n has a value of from 0 to 14, or an epoxy novolak resin



wherein n has a value of from 0 to 4, with one or more unsaturated monocarboxylic fatty acids with 18 carbon atoms per molecule, and then with one or more lower unsaturated acids chosen from acrylic and methacrylic acids, said fatty and lower acids being used in an overall amount equivalent, or about equivalent to the number of oxirane bridges of the epoxy or epoxy novolak resin and said fatty acids being used in an amount of from 20 to 80 moles for each 100 moles of the sum of the fatty and lower acids;

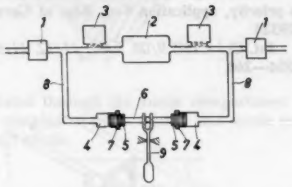
(b) one or more mono- or polyfunctional unsaturated monomers copolymerizable with said unsaturated epoxy resin ester; and

(c)a photosensitive substance which decomposes under the action of ultra-violet radiations and promotes cross-linking by ultra-violet radiations; the component (a) being present in the composition in an amount of from 3 to 97 parts by weight for each 100 parts by weight of the sum of components (a) and (b) and the component (c) in an amount of from 1.2 to 3.5 parts by weight for each 100 parts by weight of the sum of the components (a) and (b) and wherein said unsaturated epoxy resin ester (I) contains unreacted internal hydroxy groups where n = 1 to 14.

4,203,817
METHOD OF AND DEVICE FOR MOVING LIQUID SAMPLES

Wolfgang Schütt, 141, Doberaner-Strasse; Hans-Ludwig Jensen, 6, Klosterbach-Strasse, both of, Rostock; Werner Eberlein, 5, Reinhold-Härzer-Strasse, and Günter Schöppe, 24, Hans-Eisler-Strasse, both of, Jena, all of German Democratic Rep., assignors to JENOPTIK JENA G.m.b.H., Jena, Fed. Rep. of Germany

Filed Mar. 6, 1979, Ser. No. 17,960
Int. Cl.[2] G01N *27/26, 31/08*
U.S. Cl. 204—180 R 3 Claims



1. Method of moving liquid sample material in a measuring chamber by small amounts under elimination of any turbulence, said chamber being provided with an inlet duct and an outlet duct,

comprising the steps of

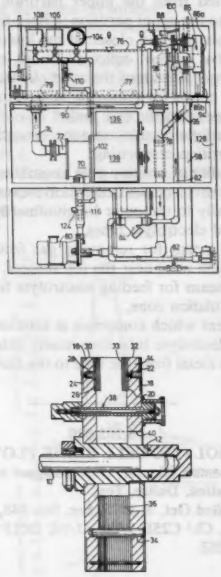
closing said inlet duct and outlet duct, and displacing said liquid sample material in a duct system by means of a reversely directed pair of pistons rigidly connected to each other.

4,203,818
ELECTROLYZERS

Bruce B. Greaves, 3 Fishermans Close, Formby, Merseyside, L37 1XX, England

Filed May 9, 1979, Ser. No. 37,368
Claims priority, application United Kingdom, May 17, 1978, 20020/78
Int. Cl.[2] C25B *8/00, 15/08, 1/34*
U.S. Cl. 204—212 20 Claims

1. In an electrolytic cell having an electrolysing chamber, a pair of terminal electrodes located within the chamber and adapted to be connected to the poles of a D.C. source, a plurality of bipolar electrodes in the form of parallel flat annular discs which are located in the chamber between the terminal electrodes and which are rotatable about a common central axis through their centres, and an electrolyte inlet located radially outwardly of the bipolar electrodes, the improvement in that said electrolyte inlet to the cell comprises at least one

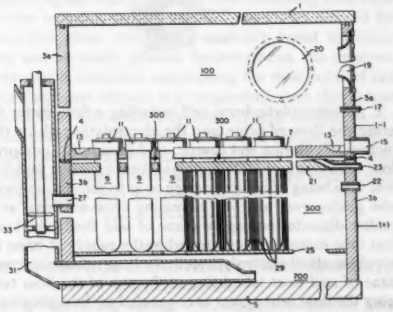


elongate slot extending in a direction generally perpendicular to the planes containing said bipolar disc electrodes.

4,203,819
ELECTROLYTIC CELL WITH FLOW DETECTION MEANS

Steven A. Cope, North Little Rock, Ark., assignor to E. I. Du pont de Nemours and Company, Wilmington, Del.

Filed Jan. 26, 1978, Ser. No. 872,666
Int. Cl.[2] C25C *3/14, 3/02, 7/00*
U.S. Cl. 204—247 6 Claims



1. In a cell for the electrochemical separation of metals from electrodissociatable compounds thereof in the molten state having

(a) an enclosed shell having top, bottom and side members;

(b) a molten metal collection zone comprising

(1) an upper horizontal fluid-tight partition positioned below the top of the cell, the partition having a plurality of open risers extending above the upper surface of the

partition, the riser tubes being in fluid communication with

(2) a plurality of corresponding solid electrolyte tubes suspended from the upper partition, the tubes being joined to the upper partition in fluid-tight relationship at the upper end and closed at the lower end,

(3) negative current collector means extending into the upper end of each of the solid electrolyte tubes, and

(4) outlet means for removing molten metal in the collection zone from the cell; and

(c) an electrolyte circulation zone beneath the upper horizontal partition comprising

(1) a plurality of positive pole assemblies, each connected with positive current collector means, positioned concentrically to the outer longitudinal surface of each of the solid electrolyte tubes,

(2) outlet means for removing gas from the electrolyte circulation zone near the top thereof, and

(3) inlet means for feeding electrolyte feed materials into the circulation zone,

the improvement which comprises at least one opening in the wall of each electrolyte tube for visually detecting the rate of flow of molten metal from the tube to the molten metal collection zone.

4,203,820

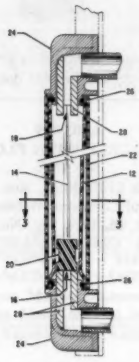
ELECTROLYTIC CELL BRINE FLOW METER

Russell M. Wiseman, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Oct. 4, 1978, Ser. No. 948,413

Int. Cl.[2] C25B *9/00, 15/08;* **G01F** *1/22*

U.S. Cl. 204—263 **5 Claims**



1. An electrolytic brine cell including a flow meter for metering the flow of brine into the electrolytic cell for the production of chlorine and caustic, said flow meter comprising: a float tube made of UDEL polysulfone injection molded; said float tube being of a fluted design so as to provide uniform float tube guides over an ever increasing cross-sectional area; the smaller diameter conjugate plane of said float tube being the float tube ingress and connected to the supply of brine for use in a chlor-alkali electrolytic cell; the larger diameter conjugate plane of said float tube being at the top of the float tube and being the float tube egress as connected to the piping for transfer into a chlor-alkali electrolytic cell for the production of chlorine and caustic; a float riding in the interior of said float tube along said float tube guides in close tolerance thereto so as to restrain horizontal movement thereof during the passage of flow by said float in said float tube; said float tube having a float tube protector completely surrounding said float tube and being of a visually transparent material resistant to the transmittance of UV radiation; and said float tube, along with said float tube protector being connected to associated piping for transmitting the supply of brine having a high pH therethrough by means of an O-ring seal at each end of said float tube.

4,203,821

APPARATUS FOR CARRYING OUT ELECTROCHEMICAL REACTIONS AND CORRESPONDINGLY SUITABLE BIPOLAR ELECTRODES

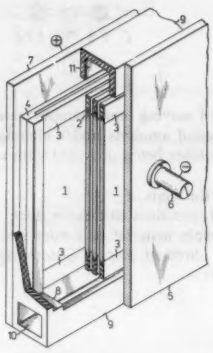
Jürgen Cramer, and Werner Lindner, both of Eppstein, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,049

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739324

Int. Cl.[2] C25B *9/00, 9/02, 11/12, 11/02*

U.S. Cl. 204—268 **9 Claims**



1. A continuous flow cell for electrochemical reaction with an electrolyte comprising a housing; a plurality of bipolar electrodes provided in said housing, each bipolar electrode being formed of an electrically active plate and a frame of electrically non-conducting material secured to the periphery of said active plate; an inlet tunnel in said housing having an inlet to introduce said electrolyte from beneath said electrode plates; a collecting tunnel in said housing disposed above and common to all of said electrode plates for collecting electrolyte which flows thereto; said electrode plates being arranged in a stack with the plane of each plate being parallel to the direction in which said electrolyte flows in said housing from said inlet to said collecting tunnel; and means for supplying an electric current to said cell.

4,203,822

METHOD OF PRODUCING SOLS BY ELECTRODIALYSIS

Barry A. Schenker, Mayfield Heights; Thomas T. Sugano, Painesville; Neil W. Stillman, Madison, and Kevin J. O'Leary, Cleveland Heights, all of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

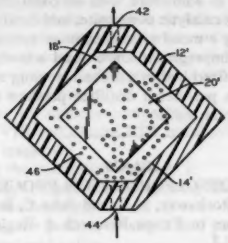
Division of Ser. No. 787,314, Apr. 14, 1977, Pat. No. 4,147,605, which is a continuation-in-part of Ser. No. 669,188, Mar. 22, 1976, abandoned. This application Jan. 24, 1979, Ser. No. 6,091

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—301 **2 Claims**

1. An electrodialytic cell comprising a housing defining an anode compartment and a cathode compartment, with the anode compartment having a diamond-shaped vertical cross-section and being provided with an inlet and an outlet for removing anolyte therefrom; said anolyte having therein a plurality of beads; a cation permselective membrane separating the anode compartment from the cathode compartment; an anode positioned in the anode compartment, and a cathode

positioned in the cathode compartment for passing electrical current through the cell; and a conduit communicating with the inlet and outlet of anode compartment whereby anolyte



can be circulated through the anode compartment so as to impinge said plurality of beads against said anode to prevent buildup on said anode.

4,203,823

COMBINED COAL LIQUEFACTION-GASIFICATION PROCESS

Norman L. Carr, Allison Park; Ronald Schleppy, Jr., Pittsburgh, both of Pa.; Bruce K. Schmid, Denver, Colo., and Yatish T. Shah, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 3, 1978, Ser. No. 921,338
Int. Cl.[2] C10G *1/06*; C10J *3/00*
U.S. Cl. 208—10 **22 Claims**

1. A combination coal liquefaction-gasification process comprising passing mineral-containing feed coal, hydrogen, recycle dissolved liquid coal solvent, recycle dissolved coal which is solid at room temperature and recycle mineral residue to a coal liquefaction zone to dissolve hydrocarbonaceous material from mineral residue and to hydrocrack said hydrocarbonaceous material to produce a liquefaction zone effluent mixture comprising hydrocarbon gases, dissolved liquid coal, solid dissolved coal and suspended mineral residue; recycling to said liquefaction zone a portion of said dissolved liquid coal, solid dissolved coal and mineral residue; the ratio of said recycle portion to said feed coal being established so that the net yield after recycle based on dry feed coal of solid dissolved coal is 17.5 weight percent or lower and the net yield after recycle based on dry feed coal of 450° to 850° F. dissolved liquid coal is at least 35 weight percent greater than the net yield of solid dissolved coal; separating dissolved liquid coal and hydrocarbon gases from solid dissolving coal and mineral residue to produce a gasifier feed slurry comprising substantially the entire net yield of solid dissolved coal and mineral residue of said liquefaction zone; passing said gasifier feed slurry to a gasification zone including an oxidation zone for the conversion of the hydrocarbonaceous material therein to synthesis gas; converting at least a portion of said synthesis gas to a gaseous hydrogen-rich stream and passing said hydrogen-rich stream to said liquefaction zone to supply process hydrogen thereto; the amount of carbonaceous material passed to said gasification zone being sufficient to enable said gasification zone to produce at least the entire hydrogen requirement of said liquefaction zone.

4,203,824

POLYVINYLPYRROLIDONE DEWAXING AID FOR BRIGHT STOCKS

Biddanda U. Achia, Sarnia, and David H. Shaw, Camlachie, both of Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 22, 1978, Ser. No. 972,230
Int. Cl.[2] C10G *43/06, 43/08*
U.S. Cl. 208—33 **11 Claims**

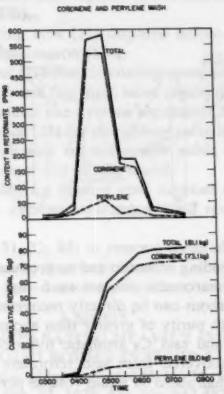
1. A solvent dewaxing process comprising mixing a waxy hydrocarbon oil with a polyvinylpyrrolidone dewaxing aid and a ketone dewaxing solvent and chilling said mixture to form a slurry comprising solid particles of wax and a solution of dewaxed oil and ketone dewaxing solvent and separating said wax from said dewaxed oil solution.

4,203,825

METHOD FOR REMOVING CORONENE FROM HEAT EXCHANGERS

Walter S. Kmak, Scotch Plains, N.J., and Charles Monzo, Sea Brook, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1979, Ser. No. 8,777
Int. Cl.[2] C07C *15/12*; C10G *9/16, 39/00*
U.S. Cl. 208—48 R **7 Claims**



1. A method for removing a coronene deposit in a reforming process which comprises the steps of:

(a) contacting a hydrocarbonaceous feedstock with a catalyst in the presence of added hydrogen at reforming conditions in a reforming zone;

(b) passing the resulting total reforming zone effluent into a heat exchange zone, said reforming zone effluent comprising coronene, at least a portion of which deposits in a portion of the heat exchange zone;

(c) separating the heat exchanged total reforming zone effluent into a hydrogen-rich gaseous phase, and a liquid hydrocarbon phase comprising normally liquid hydrocarbons and normally gaseous hydrocarbons, the improvement which comprises maintaining the dew point of said reforming zone effluent at a temperature such that at least a portion of said reforming zone effluent condenses to a liquid phase in said portion of the heat exchange zone of step (b) having said coronene deposit, for a time sufficient to remove at least a portion of said coronene deposit from said portion of heat exchange zone.

4,203,826

PROCESS FOR PRODUCING HIGH PURITY AROMATIC COMPOUNDS

Warden W. Mayes, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

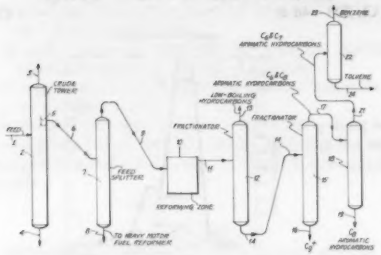
Filed Aug. 24, 1977, Ser. No. 827,356
Int. Cl.[2] C10G *35/04*
U.S. Cl. 208—64 **17 Claims**

1. A process for the production by reforming of high-purity commercial quality aromatic hydrocarbons, selected from the group consisting of C_7, C_8, or C_7 and C_8 aromatic hydrocarbons, from a full boiling C_7–C_8 naphtha fraction without the

use of prefractionation of the naphtha fraction or solvent extraction or clay treatment of the reformate, consisting essentially of the steps of:

(a) providing a starting material determined as follows: (i) for the production of high-purity C_7 aromatic, a C_7 full boiling carbon number naphtha fraction; (ii) for the production of high-purity C_8 aromatic, a C_8 full boiling carbon number naphtha; (iii) for the production of high-purity C_7 and C_8 aromatic hydrocarbons, a C_7 and C_8 full boiling carbon number naphtha fraction;

(b) catalytically reforming said starting material under reforming conditions of sufficient severity to convert the nonaromatic present therein essentially completely to the



corresponding aromatic and to produce a reformate having a nonaromatic content such that said C_7 aromatic hydrocarbons can be directly recovered from said reformate with purity of greater than about 95 liquid volume percent and said C_8 aromatic hydrocarbons can be directly recovered from said reformate with a purity of greater than about 99 liquid volume percent, by fractional distillation; and

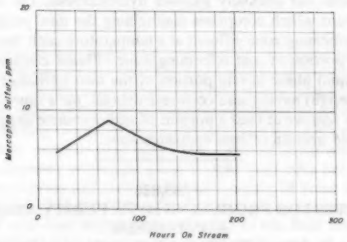
(c) fractionating said reformate to directly recover said aromatic hydrocarbons in highly pure form.

4,203,827

PROCESS FOR TREATING SOUR PETROLEUM DISTILLATES

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 28, 1978, Ser. No. 940,041
Int. Cl.[2] C10G *27/06*
U.S. Cl. 208—206 **16 Claims**



1. A process for treating a mercaptancontaining sour petroleum distillate which comprises:

(a) passing said distillate in admixture with an oxidizing agent and an aqueous solution of an alkali metal hydroxide into contact with a catalytic composite consisting essentially of a metal phthalocyanine mercaptan oxidation catalyst and a quaternary ammonium compound impregnated on a solid adsorbent support disposed as a fixed bed in a first treating zone;

(b) passing the effluent comprising said distillate and said aqueous solution of alkali metal hydroxide from said first treating zone in admixture with an oxidizing agent into contact with a catalytic composite, said catalytic composite comprising a metal phthalocyanine mercaptan oxidation catalyst impregnated on a solid adsorbent support disposed as a fixed bed in a second treating zone; and

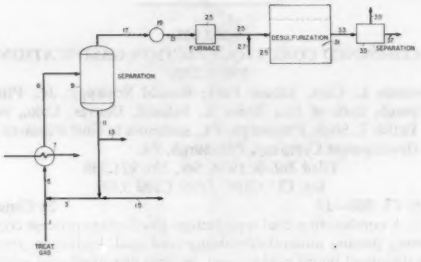
(c) recovering a petroleum distillate product substantially free of mercaptan sulfur.

4,203,828

HYDRODESULFURIZATION PROCESS

Sheldon Bodnick, Rockaway, N.J., and John C. Brice, Epsom, England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 26, 1976, Ser. No. 690,254
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—213 **7 Claims**



1. In a process for hydrodesulfurizing a sulfur-containing heavy hydrocarbon oil wherein said oil is contacted with hydrogen and steam in the presence of a hydrodesulfurization catalyst at hydrodesulfurization conditions including a temperature varying from about 400° F. to about 900° F. and a pressure varying from about 800 psig to about 3000 psig, the improvement which comprises:

(a) introducing a hydrogen-containing gas into a circulating water stream to produce a mixed stream;

(b) heating said mixed stream to a temperature below about 450° F. to vaporize a portion of said water and to produce a steam and hydrogen-containing gas;

(c) separating the steam and hydrogen-containing gas from the unvaporized water;

(d) contacting said steam and hydrogen-containing gas with a sulfur-containing heavy hydrocarbon oil in the presence of said hydrodesulfurization catalyst under said hydrodesulfurization conditions; and

(e) recovering a hydrocarbon oil reduced in sulfur content.

4,203,829

CATALYST, METHOD OF PREPARATION AND USE THEREOF IN HYDRODESULFURIZING CRACKED NAPHTHA

Ralph J. Bertolacini, Chesterton, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 28, 1978, Ser. No. 946,573
Int. Cl.[2] C10G *23/02*; B01J *23/88*
U.S. Cl. 208—216 R **13 Claims**

1. A method for preparing hydrodesulfurization catalyst comprising Group VIB metal and Group VIII metal on a solid support comprising magnesium oxide and aluminum oxide, which method comprises:

(1) forming an aqueous composition comprising dissolved Group VIB and Group VIII metal compounds and suspended magnesia;

(2) drying the composition of step 1;

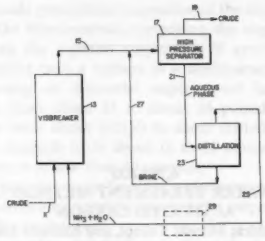
(3) blending compositions comprising the product of step 2 and particulate alumina;
(4) forming the product of step 3 into pellets; and
(5) calcining said pellets.

8. A process for the selective desulfurization of cracked naphthas, which process comprises contacting a cracked naphtha in a reaction zone under hydrodesulfurization conditions and in the presence of hydrogen with a catalyst prepared by a method which comprises:
(1) forming an aqueous composition comprising dissolved Group VIB and Group VIII metal compounds and suspended magnesia;
(2) drying the composition of step 1;
(3) blending compositions comprising the product of step 2 and particulate alumina; and
(4) forming the product of step 3 into pellets;
(5) calcining said pellets.

4,203,830
VISBREAKING PROCESS FOR DEMETALATION AND DESULFURIZATION OF HEAVY OIL

Louis D. Rollmann, Princeton, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,660
Int. Cl.² C10G *34/00, 31/06, 29/02*
U.S. Cl. 208—236 **9 Claims**

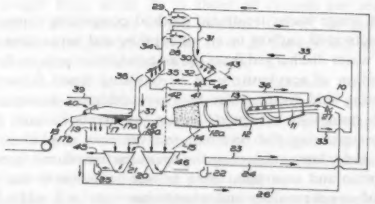


1. A visbreaking process for demetalation and desulfurization of a heavy hydrocarbon feed stock which comprises contacting said stock with an aqueous solution of 0.5 to 30 weight percent ammonia at visbreaking temperature and recovering a hydrocarbon product from said contacting having a reduced viscosity which is at least partially demetalized and desulfurized.

4,203,831
6/30 COAL WASHING PLANT

Derek Parnaby, Horsley Hall, Eastgate, Bishop Auckland, Durham, England

Filed Jun. 23, 1978, Ser. No. 918,432
Int. Cl.² B03B *7/00*
U.S. Cl. 209—13 **8 Claims**

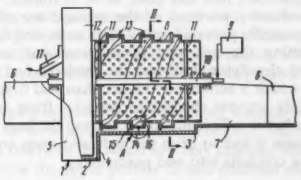


1. Coal washing plant comprising an inclined rotatably mounted barrel (**12**) having an internal helical scroll, (**12***a*);
means (**10**) for feeding raw coal into the upper end of said inclined barrel;
means (**11**) introducing wash liquor into said barrel; outlet means (**33**) below said feed means and said wash liquid means at said upper end for disposal of unwanted materials therefrom;
sieve means (**17**) subsequent the lower end of said barrel for screening washed coal issuing from said barrel;
removal means (**18**) for removing washed coal after said screening from the top side of said sieve means;
at least one cyclone separator (**28, 29**);
said sieve means (**17**) having a first sieve region (**17***a*) of relatively fine mesh and a second sieve region (**17***b*) of coarser mesh;
a first collecting tank (**20**) disposed below said first fine mesh sieve region (**17***a*);
a second collecting tank (**21**) disposed below said second coarse mesh sieve region (**17***b*);
first pump means (**22**) for circulating particles and liquor passing through said fine mesh sieve region from said first tank to said at least one cyclone separator (**28, 29**);
second pump means (**25**) for circulating particles and liquor passing through said second coarse mesh sieve region (**17***b*) to said upper end of said barrel;
means (**34, 35, 38,**) for feeding coal material separated by said least one cyclone separator to said removal means (**18**);
and means (**30, 31, 32, 43**) to remove material rejected by said at least one cyclone separator.

4,203,832
DEVICE FOR SEPARATING HEAVIER IMPURITIES FROM SOLID BODIES IN FLUID FLOW

Nikolai M. Datsenko, ulitsa Frunze, 131, kv. 16, Kiev, U.S.S.R.

Filed Sep. 15, 1978, Ser. No. 942,487
Int. Cl.² B03B *7/00*
U.S. Cl. 209—44 **8 Claims**



1. A separating and cleaning device having inlet and exit sides for separating heavier impurities from solid bodies, such as roots and tubers or the like conveyed by a fluid flow supply source comprising: a trough-like casing for receiving said fluid from said supply source; a hollow drum having a cylindrical perforated side wall being disposed substantially horizontally and coaxially in said trough-like casing and being supported on a rotatable shaft; an appliance for separating, receiving and unloading impurities disposed in said trough-like casing and being secured to said drum at the inlet side of said device; elements in said drum for moving said impurities towards said appliance in the form of grooves arranged spirally in the side wall of said drum throughout its length; each said groove having a cylindrical side wall and two face walls arranged substantially perpendicularly to said cylindrical perforated side wall of said drum; the cylindrical side wall of each groove protrudes beyond the perforated side wall of said drum, the face walls of said grooves nearest said appliance serve for moving towards said appliance sand or other relatively small impurities falling out from the perforated side wall of said drum, and the internal surfaces of each groove serve for moving toward said appliance stones or other relatively large impurities which have settled in said drum; and the roots and tubers

being carried by said fluid through said drum to the exit of said device.

4,203,833

CONVEYING AND CLASSIFYING OF PARTICULATE SUBSTANCES

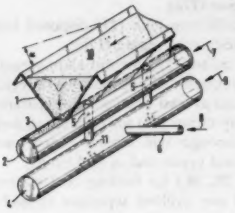
Heinrich Wagener, Bochum, and Karl-Heinrich van Heek, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,108

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737635

Int. Cl.[2] B07B *4/08*

U.S. Cl. 209—139 R **26 Claims**



4. Apparatus for conveying and simultaneously classifying a mixture of heavier and lighter particles, comprising first means defining an inclined substantially horizontal travel path which is laterally bounded by two upwardly divergent side walls and has a length and a width; second means defining below said path an enclosed passageway which extends along the path, including a plurality of upright classifying conduits having lower open ends communicating with said passageway and upper open ends communicating with said path; third means for directing a stream of fluidizing fluid at a first pressure from below and substantially centrally between said side walls in upward direction into said path, so as to fluidize the mixture therein, whereby portions of the mixture are also made to travel repeatedly past said upper open ends; and fourth means for admitting through said passageway and said conduits streams of classifying fluid into the fluidized bed at a second pressure which is sufficiently higher than said first pressure to substantially prevent the lighter particles from entering said open ends but is sufficiently low to permit the heavier particles to overcome it and to drop through said open ends and said classifying conduits into said passageway.

4,203,834

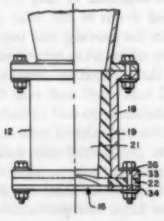
HYDROCYCLONE UNDERFLOW DENSITY CONTROL

David L. Martin, Woodside, Calif., assignor to Krebs Engineers, Menlo Park, Calif.

Continuation-in-part of Ser. No. 871,391, Jan. 23, 1978. This application Aug. 21, 1978, Ser. No. 935,525

Int. Cl.[2] B04C *5/16*

U.S. Cl. 209—211 **4 Claims**



1. A hydrocyclone which when in upright position has a separating chamber that is annular in section with a lower conical shaped portion having an opening at its lower apex end for discharge of an underflow containing heavier separated solids, the chamber also having means forming an inlet opening connected tangentially with the upper portion of the chamber and means forming an overflow outlet communicating with a vortex finder disposed axially of the chamber for discharge of overflow material, control means secured directly to the lower end of the hydrocyclone, said control means consisting of a device made of resilient material, said device having a plurality of flexible sectors, said sectors when relaxed extending across the apex opening, the apex end of each sector being substantially aligned with the axis of the chamber with its side edges extending generally radially from the perimeter of the apex opening to the central axis of the hydrocyclone, the side edges of each sector when relaxed being in juxtaposition with the side edges of adjacent sectors but spaced therefrom, said sectors being so constructed that they present increasing resistance to downward deflection and being deflected downwardly by the thrust of underflow material overlying the same, resistance to such deflection serving as means to effect controlled underflow discharge, whereby the density of the discharging underflow material is maintained substantially constant.

4,203,835

WASTE WATER TREATMENT METHOD USING ACTIVATED CARBON

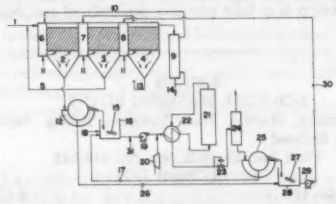
Yoshiaki Tagashira; Hitoshi Takagi, and Katsumi Inagaki, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 27, 1977, Ser. No. 836,997

Claims priority, application Japan, Aug. 25, 1977, 52-101068

Int. Cl.[2] C02B *1/14*

U.S. Cl. 210—33 **18 Claims**

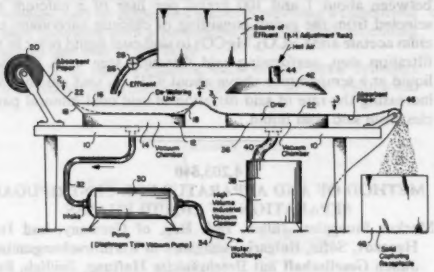


1. A waste water treatment method comprising contacting with activated carbon in an adsorption and separation zone waste water discharged from the ammoxidation process for the production of acrylonitrile or an oxidized liquid formed by subjecting said waste water to a wet oxidation treatment to adsorb onto said activated carbon pollutants in said waste water; separating the resulting mixture into a spent carbon slurry and water; subjecting the spent carbon slurry from the adsorption and separation zone to wet oxidation in the presence of copper values and ammonium ions at a pH of not higher than 5 in a regeneration zone to thereby regenerate the spent carbon; and recycling the regenerated activated carbon to the adsorption and separation zone.

4,203,836
METHOD AND APPARATUS FOR REMOVING PRECIPITATED SUSPENDED SOLIDS FROM AN EFFLUENT

Richard D. Hallack, 500 Oak Knoll Ave. #24, Pasadena, Calif. 91101, and Tommie B. Carter, 806 Valencia Mesa Dr., Fullerton, Calif. 92632

Continuation-in-part of Ser. No. 777,687, Jun. 25, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,373
Int. Cl.[2] C02B *1/20*; B01D *33/00*
U.S. Cl. 210—42 R 7 Claims



1. In a method for separating hydroxide-precipitative metals from an aqueous solution by the steps of adding a base to the solution for raising the pH of the solution above 8.0 and forming a hydroxide precipitate suspension of the metals present in the water, the improvement comprising the steps of:

(a) feeding the aqueous suspension of precipitated metal hydroxides onto a surface of a liquid-absorbing medium comprising an industrial paper towel having a basis weight from about 28 to about 34 pounds per ream, a caliper from about 0.0130 to about 0.0145, an aged-wet tensile strength from about 16 to 25 ounces and an aged absorption of less than 40 seconds;

(b) absorbing the water from the aqueous suspension into the liquid-absorbing medium leaving the suspended mtal hydroxides unabsorbed;

(c) removing the absorbed water from the liquid-absorbing medium surface opposite the surface in contact with the aqueous suspension for providing additional absorption capability to the liquid-absorbing medium;

(d) concomitantly absorbing additional water into the liquid-absorbing medium as a result of the removal of the previously absorbed water; and

(e) collecting the water removed from the liquid-absorbing medium.

5. Apparatus for separating suspended metal hydroxides from an aqueous suspension containing metal hydroxides, said apparatus comprising:

(a) a solid-liquid separation unit having a perforated base and a liquid-receiving chamber below said base;

(b) a paper positioned on the base covering and sealing the perforations in the base for absorbing water from an aqueous suspension to the substantial exclusion of absorbing suspended metal hydroxides, said paper having a basis weight from about 28 to about 34 pounds per ream, a caliper from about 0.0130 to about 0.0145, an aged-wet tensile strength from about 16 to 25 ounces and an aged absorption of less than 40 seconds;

(c) means for introducing an aqueous suspension containing suspended metal hydroxides onto the surface of the paper;

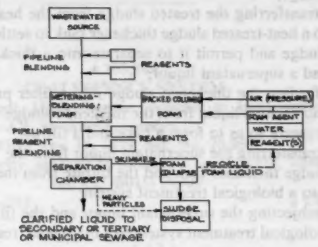
(d) means for containing the liquid containing suspended metal hydroxides on the surface of the paper and preventing the liquid containing suspended metal hydroxides from flowing around the paper; and

(e) means for removing absorbed water from the paper, said last named means comprising a vacuum paper having an intake coupled to the liquid-receiving chamber for establishing reduced pressure on the underside of the paper through the perforations in the base.

4,203,837
PROCESS FOR REMOVAL OF DISCRETE PARTICULATES AND SOLUTES FROM LIQUIDS BY FOAM FLOTATION

John H. Hoge, and John H. Hubbard, both of 4204 Airport Rd., Cincinnati, Ohio 45226

Continuation of Ser. No. 649,690, Jan. 16, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,492
Int. Cl.[2] C02B *1/20*; C02C *5/02*
U.S. Cl. 210—44 4 Claims



1. A process for removal of discrete particulates from wastewater by foam flotation which comprises the steps:

(a) adding at least one agent to the wastewater containing the particulates to alter the surface charge of said particulates;

(b) preparing a foam solution comprising a foaming agent dissolved in a solvent, said foaming agent being specifically ionic for attracting the surface charge of the particulates to be removed;

(c) mixing said foam solution with a gas to produce a pregenerated foam of bubbles having surface active ionic films;

(d) blending said pregenerated foam with the wastewater containing the particulates for a period of time sufficient to insure that substantially all the particulates will contact the surface active films of said bubbles and ionically attach thereto;

(e) discharging said blend into a chamber wherein said blend is able to flow at a diminishing velocity, whereby said bubbles rise from the liquid to freely coalesce into a floating layer in the upper portion of said chamber and a clarified wastewater which is separately withdrawn from said chamber for disposal; and

(f) removing the coalesced foam layer containing the floated particulates for disposal.

4,203,838
PROCESS FOR THE TREATMENT OF SLUDGE

Koh Shimizu; Terumi Uchimura; Ken-Ichi Uede, and Katuyoshi Nakamura, all of Osaka, Japan, assignors to Kubota Tekko Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 775,599, Mar. 8, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,877
Claims priority, application Japan, Mar. 13, 1976, 51-27331; Jun. 16, 1976, 51-71635
Int. Cl.[2] C02C *3/00*
U.S. Cl. 210—63 R 3 Claims

1. A process for treating sludge comprising the steps of:

(1) introducing raw sludge into a raw sludge thickener to thicken said sludge and producing raw sewage as a supernatant;

(2) transferring said thickened sludge into a thickened sludge storage tank to store said thickened sludge;

(3) transferring the thickened sludge from the thickened

sludge storage tank into a heat exchanger to preheat the sludge;

(4) feeding the preheated sludge along with steam and compressed air into a reactor to oxidize and heat-condense the sludge at 130°–165° C. under a pressure of about 10 kg/cm^2 for at least 30 minutes while separating malodorous gas therefrom, thereby improving the filterability of the sludge;

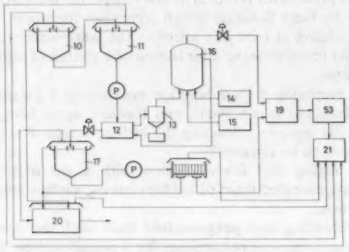
(5) transferring the sludge treated in step (4) through said heat exchanger to be used as a direct or indirect source of heat to preheat the untreated sludge, said treated sludge being transferred through the heat exchanger by means of a conduit which separates the treated from the untreated sludge;

(6) transferring the treated sludge from the heat exchanger to a heat-treated sludge thickener tank to settle the treated sludge and permit it to separate into a thickened sludge and a supernatant liquor;

(7) feeding the thickened sludge into a filter press to filter and remove liquid from the thickened sludge by means of pressure so as to form a cake and a filtrate;

(8) transferring the supernatant liquor from the heat-treated sludge thickener tank and the filtrate from the filter press into a biological treatment system;

(9) subjecting the supernatant liquor and the filtrate in said biological treatment system to a biological treatment by at least one step of the activated sludge process in which raw sewage is added from the raw sludge thickener and discharging the final effluent thus produced;



(10) incinerating the malodorous gas from the reactor and the cake from the filter press by conveying said malodorous gas and said cake by separate means into an incinerator;

(11) said process being such that malodorous gases are produced in the raw sludge thickener, the thickened sludge storage tank, the heat-treated sludge thickener tank, the filter press and the biological treatment system during the aforementioned treatment steps, and wherein such malodorous gases are deodorized by contacting them with ozone produced by an ozone generator by conveying these malodorous gases by separate means into a deodorizing system containing ozone therein;

(12) said incinerator being characterized by giving off an exhaust gas produced from the inicineration of the malodorous gases in step (10), said exhaust gas containing sulfurous gas, which sulfurous gas is removed from the exhaust gas by means of sodium hydroxide in a desulfurizing step to produce sodium sulfite; and

(13) feeding the deodorized gas from step (11) into an ozone removing tower to remove any unreacted ozone and contacting the unreacted ozone with sodium sulfite produced in step (12) above while discharging the deodorized gases.

4,203,839

PROCESS FOR SEPARATING SOLIDS FROM COAL LIQUIDS

Norman L. Carr, Allison Park, and Edgar L. McGinnis, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 893,085
Int. Cl.^{2} B01D *37/02*
U.S. Cl. 210—71 **14 Claims**

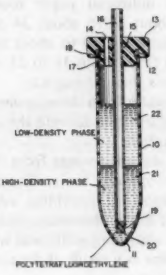
1. A process for filtering particles of coal minerals from a coal liquid in which they are suspended comprising adding between about 1 and 100 grams per liter of a calcium salt selected from the group consisting of calcium carbonate, calcium acetate and $CaCO_3.MgCO_3$ to said coal liquid prior to the filtration step, performing said filtration step with the coal liquid at a temperature above about 475° F., said calcium salt increasing the rate of said filtration of said coal mineral particles from said coal liquid.

4,203,840

METHOD OF AND APPARATUS FOR CENTRIFUGAL SEPARATION OF LIQUID PHASES

Markus Stoeppler, Jülich, Fed. Rep. of Germany, and Ivan Havezov, Sofia, Bulgaria, assignors to Kernforschungsanlage Jülich Gesellschaft mit Beschränkter Haftung, Juülich, Fed. Rep. of Germany

Filed Dec. 20, 1971, Ser. No. 209,882
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1971, 2115032
The portion of the term of this patent subsequent to May 20, 1996, has been disclaimed.
Int. Cl.^{2} B01D *11/00*
U.S. Cl. 210—83 **10 Claims**



8. A method of separating liquid phases of a liquid/liquid extraction mixture comprising the steps of centrifugally separating said mixture into a plurality of phases, inserting a plugged tube below one of said phases and into another phase, and centrifugally dislodging the plug of said tube to communicate between said tube and said other phase.

4,203,841

APPARATUS FOR HIGH-EFFICIENT MICROBIOLOGICAL OXIDATION TREATMENT

Norio Shimizu; Youji Odawara; Tetsuo Yamaguchi; Setsuo Saitou, all of Hitachi; Azuma Nakaoka, Chiba, and Kazuaki Ichihashi, Yamaguchi, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 722,034, Sep. 10, 1976, abandoned. This application Dec. 6, 1977, Ser. No. 857,890
Claims priority, application Japan, Sep. 10, 1975, 50/108889
Int. Cl.^{2} C02C *1/06, 1/12*
U.S. Cl. 210—205 **10 Claims**

1. An apparatus for high-efficient microbiological oxidation treatment of waste liquid containing organic materials comprising:

an aeration tank body having a height that is from 5 to 30

meters and a diameter of from 0.5 to 10 meters that is substantially less than the height;

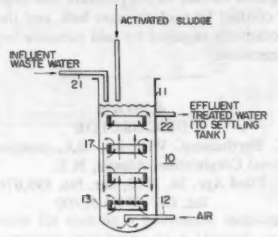
first feed means for introducing influent waste liquid containing organic materials into said aeration tank body;

second feed means for introducing activated sludge into said aeration tank body;

means for supplying and for diffusing air into the waste liquid, said air supply and diffusion means being provided at the bottom of said aeration tank body;

at least one air dispersion means provided above said air supply and diffusion means for dispersing the air ascending from the bottom of said aeration tank body into fine air bubbles, said air dispersion means comprising a cylindrical skirt provided with a perforated disc-like plate extending across one end of the skirt;

a plurality of open cylinders, each of said open cylinders comprising a cylindrical skirt, each of the cylindrical



skirts of said open cylinders and said air dispersion means being of substantially the same diameter, said open cylinders being aligned directly above said air dispersion means with a predetermined vertical distance from each other above said air supply and diffusion means, the cylindrical skirts being disposed coaxially with said aeration tank body and defining an annular space with the inner wall of said aeration tank body, the cylindrical skirts forming partially circulating streams of the waste liquid along the inside and the outside of the cylindrical skirt and forming an overall circulating stream ascending along the center parts of the skirts and descending through the annular space, the cross-sectional area of each of said dispersion means and said open cylinders being in a range of 50 to 80% of the cross-sectional area of said aeration tank body; and

discharge means for removing effluent treated liquid from said aeration tank body.

4,203,842

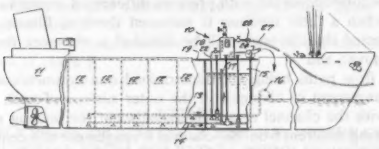
SYSTEM FOR OIL AND WATER SEPARATION

James Di Perna, 85 Foxhill Ter., Staten Island, N.Y. 10305

Filed Dec. 6, 1978, Ser. No. 966,798

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 S **1 Claim**



1. A system for oil and water separation upon a tanker ship, comprising in combination, a sealed first tank upon a ship deck, a hand-controlled vent valve upon a top of said first tank and an observation window on a side of said first tank, a siphon line having an outlet inside said tank, an opposite end of said siphon line freely depending downward into a below-deck collection tank of said ship for containing a mixture of oil and water, said syphon line being intercepted by a hand-controlled valve, an upper outlet from said first tank comprising a suction line connected to a pump for discharging oil from said tank, a lower outlet from said tank comprising a suction line connected to a second pump for discharging water from said first tank, and a second tank adjacent a side of said first tank, a pipe between a lower end of said first tank and an upper end of said second tank, a filter between an upper and lower portions of said second tank, for separation of sludge therebelow and water above, and a line from said second tank connected to a pump for draining of said water therefrom in a sludge-free condition back into the sea.

4,203,843

COALESCENCE SYSTEM

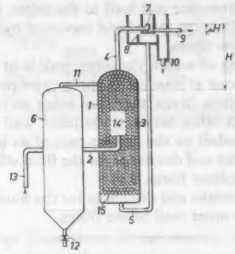
Bo R. Carlstedt, Hölö, Sweden, assignor to Ingenjorsfirman Orrje & Co AB, Stockholm, Sweden

Filed Apr. 11, 1979, Ser. No. 28,950

Claims priority, application Sweden, Apr. 18, 1978, 7804394

Int. Cl.[2] B01D *29/00*

U.S. Cl. 210—262 **2 Claims**

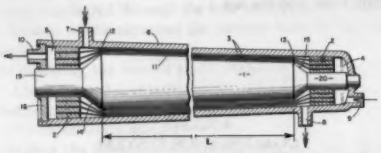


1. A device for separation of two liquids in a common mixture from each other, said liquids having different densities and being non-soluble in each other, said device comprising a pressure-tight vessel, which contains a charge of a high-porous material, which is resistant to the mixed liquids to be separated and has a high surface ratio (i.e. great surface area per volume unit) and small flow resistance, into which vessel the liquid mixture through at least one inlet conduit is to be introduced under pressure into a chamber, located within the charge in the vessel but free from the charge material, an outlet for the heavier liquid being disposed in the bottom of the vessel in order to bring said liquid to flow substantially vertically and downwardly through the vessel, after which the two liquids each are carried to an individual spillway, characterized in that the mixture introduction chamber is disposed on the vertical center axis of the separation vessel and below the top of the charge of material therein, namely particularly at about the upper third of the height of the vessel, and in that the outlet for the lighter liquid is located at the crown of said separation vessel so that also the lighter liquid is brought to flow vertically, namely upwardly, and in that in the inlet conduit for the mixture is connected upstream of the separation vessel and at substantially the same level as the latter a coarse separation tank which at its crown has a communicating connection to the uppermost portion of separation vessel and which is adapted to be entirely liquid-filled and house within itself a border surface between the heavier and the lighter liquid while providing for an introductory coarse-separation thereof, the spillways for the separated liquids being disposed on at least some distance above the crown of the separation vessel.

4,203,844
HOLLOW FIBER APPARATUS FOR THE FRACTIONATION OF FLUID ESPECIALLY USEFUL AS AN ARTIFICIAL KIDNEY

Charles Amicel, Carrieres sur Seine; Bernard Biot, Craponne; Yves Butruille, Ferrolles-Attilly, and Christian Ollivier, Vienne, all of France, assignors to Sodip SA, Meyzieu, France

Filed Sep. 20, 1977, Ser. No. 834,997
Claims priority, application France, Oct. 5, 1976, 76 30673
Int. Cl.[2] B01D *13/04*
U.S. Cl. 210—321 B **11 Claims**



1. Hollow fibre apparatus for the fractionation of fluid, especially useful as an artificial kidney, characterized in that it comprises:

a mandrel in the form of a truncated cone towards the ends of which two end walls are situated, which surround the mandrel and by which hollow fibres are held, the fibres extending from one end wall to the other, at least one of the end walls being sealed and traversed by the open ends of the hollow fibres,

an outer casing of which the inner wall is in the form of a truncated cone at least along the greater part of is length near the hollow fibres, the latter being uniformly pressed against each other between the inner wall of the casing and the mandrel on the greater part of its length,

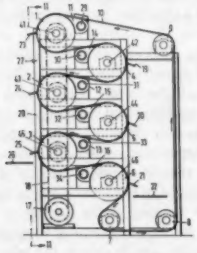
means for intake and discharge for the fluid which circulates inside the hollow fibres, and

means for the intake and discharge for the fluid which circulates on the outer wall of the fibres.

4,203,845
FILTER PRESS

Egbert K. Brouwer, Thorbeckestraat 107, Veendam, Netherlands

Filed Jan. 8, 1979, Ser. No. 1,603
Claims priority, application Netherlands, Jan. 13, 1978, 7800473
Int. Cl.[2] B01D *33/14, 35/26*
U.S. Cl. 210—386 **9 Claims**

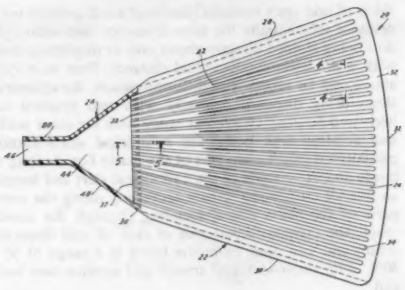


1. A filter press for at least partially separating a mixture comprising a liquid phase and a solid phase into a product substantially containing the solid phase and a product substantially containing the liquid phase, comprising a plurality of parallel cylindrical hollow filter rollers each having a perforated cylindrical surface, a plurality of return rollers and/or tensioning rollers, and an endless imperforate pressure belt passed about a circumferential portion of the cylindrical surface of each of the filter rollers and about the return and tensioning rollers, for separation of the mixture in the area of contact of the pressure belt and the circumferential portion of the cylindrical surface of each of the filter rollers under an adjustable pressure exercised by the pressure belt on the cylindrical surface, distributing means for supplying the mixture to be separated at a controllable pressure to the nip between the pressure belt and each of the filter rollers, means for circulating the endless pressure belt with simultaneous rotation of the filter rollers and return rollers, means for supplying the mixture to be separated to the distributing means, means for discharging the separated liquid phase, and means for discharging the separated solid phase, means for mounting said filter rollers in two side-by-side rows of rollers with at least two rollers in each row, and the rollers in a row located one below the other, one surface of said pressure belt engaging a first roller in one row and the belt passing directly to a first roller in the next row and the opposite surface of the pressure belt engaging the said next roller contact by said pressure belt, and thereby causing rollers successively engaged by said pressure belt to rotate in opposite directions.

4,203,846
DISC SECTOR

Kenneth E. Barthelemy, Warwick, R.I., assignor to Albany International Corporation, Albany, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,076
Int. Cl.[2] B01D *33/00*
U.S. Cl. 210—486 **11 Claims**



1. A sector for a disc-shaped filter comprising;

a substantially sector-shaped element having a pair of opposed sides, a pair of opposing edges including a leading edge and a trailing edge converging toward each other and terminating in a neck at one end and diverging in the other direction to terminate at an arcuate outer edge;

an arrangement of flow paths on each side and positioned to direct filtrate toward the neck;

the element adapted to be interconnected with a plurality of similar sectors to form a disc-shaped filter and adapted to be interconnected with pressure differential means so that when a filter medium is mounted thereon, filtrate collected therethrough will be directed to the neck for removal; and

the flow paths being a predetermined non-symmetrical arrangement of channels in the outer surface of each side with the channel arrangement adjacent the leading edge being different from the channel arrangement adjacent the trailing edge including a greater number of single channels adjacent the trailing edge than the number of single channels adjacent the leading edge and the channels being of predetermined size to facilitate accommodation of different amounts of filtrate on different portions of the element and maintain a predetermined pressure differential condition as the element passes through the material to be filtered and to provide streamline and low turbulence flow

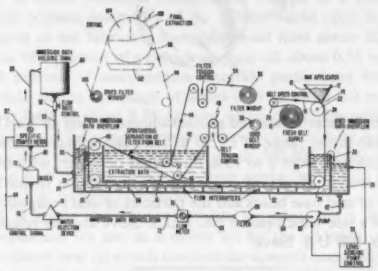
through the channels with controlled direction and without significant back-flow between channels.

4,203,847

MAKING POROUS MEMBRANES AND THE MEMBRANE PRODUCTS

Joseph D. Grandine, 2nd, Acton, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed May 25, 1977, Ser. No. 800,575
Int. Cl.[2] B29D *27/04*
U.S. Cl. 210—490 **12 Claims**



1. In a process for making a polymeric membrane that is either a microporous membrane or a skinned, asymmetric, semipermeable membrane, that has at least 60% of its volume taken up by pores, by casting a solution of the polymer in a solvent for the polymer onto the surface of a travelling backing belt in the form of a thin, continuous layer of the polymer solution, then passing the belt and thus carrying the layer into and through a formation bath comprising a liquid that is not a solvent for the polymer but that is miscible with the solvent, to form the layer into a porous membrane, with a consequent migration of the solvent liquid from the layer into the formation bath and an enrichment of the composition of the formation bath in the solvent, and thereafter removing the solvent from the porous membrane, and drying it, the improvement wherein the same liquid material that is used as the solvent component of the casting solution is used as a component of the formation bath, the balance of the formation bath consisting of a liquid that is not a solvent for the polymer, and wherein the process includes the following continuous process steps:

withdrawing from the formation bath solvent-enriched formation bath liquid,

monitoring the composition of the withdrawn liquid and adding any necessary non-solvent liquid to adjust the composition to within the desired operating range of composition for the formation bath, then

returning the composition-adjusted liquid to the bath,

the amount of composition adjustment and the rates of withdrawal and return respectively being such as to limit the deviation in composition of the bath between the point of withdrawal and return respectively to not more than about 10%.

10. A microporous membrane produced by the continuous process of claim 9.

4,203,848

PROCESSES OF MAKING A POROUS MEMBRANE MATERIAL FROM POLYVINYLIDENE FLUORIDE, AND PRODUCTS

Joseph D. Grandine, II, Acton, Mass., assignor to Millipore Corporation, Bedford, Mass.

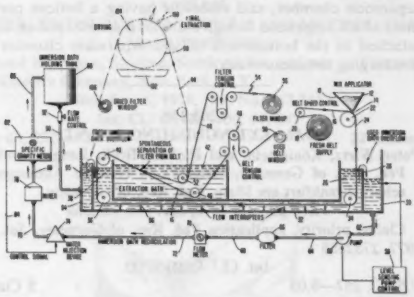
Filed May 25, 1977, Ser. No. 800,574
Int. Cl.[2] B29D *27/04*
U.S. Cl. 210—490 **21 Claims**

1. A continuous process for forming a microporous membrane from a polymer that is at least 90% by weight of polyvinylidene fluoride, the membrane having at least 60% of its volume taken up by intercommunicating capillary pores of average size below about 14 micrometers, comprising:

applying a layer of a solution consisting essentially of the polymer in acetone at a polymer concentration of from about 15% to about 25% by weight of the solution as a thin layer to a rigidly supported surface of a travelling backing belt,

immersing the belt carrying the layer of polymer solution in a formation bath consisting essentially of a mixture of acetone and water, with the acetone forming from about 55% to about 85% by volume of the bath, the balance being water,

maintaining the layer immersed in and passing it through an elongate path in the formation bath between the point of entry of the belt and layer into the formation bath and the point of departure of the belt and layer from the bath, to permit replacement of the acetone in the layer with the formation bath liquid, until the layer has been converted to a microporous membrane having an average pore size



in the range from about 25 nanometers to about 14 micrometers, wherein the pores intercommunicate, form at least 60% by volume of the membrane, and are of substantially uniform size, and the porous structure is essentially fully formed,

continuously withdrawing formation bath liquid from the bath adjacent the entry point of the belt into the bath,

continuously monitoring the composition of the withdrawn formation bath liquid, and adding the necessary amount of water to maintain the liquid at a composition within the specified range of composition for the bath, so that it is recirculable liquid,

returning the recirculable liquid to the formation bath adjacent the departure point of the belt from the bath,

separating the formed membrane from the belt,

washing the membrane with water, apart from the formation bath, to extract any residual acetone or formation bath liquid from the membrane, and then

drying the membrane to remove water.

6. A microporous membrane of polyvinylidene fluoride prepared in accordance with claim 1.

4,203,849

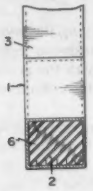
APPARATUS FOR CLEANING WATER CONTAINING FOREIGN PARTICLES SUCH AS SUSPENDED MATTERS OR OIL

Haruko Ino, and Risaburo Ino, both of 9-119, Shimogofukumachi, Hakata-ku, Fukuoka, Japan

Filed Nov. 10, 1975, Ser. No. 630,395
Claims priority, application Japan, Nov. 14, 1974, 49/138328[U]; Nov. 29, 1974, 49/137982[U]
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—522 **5 Claims**

1. An apparatus for cleaning water containing foreign material such as suspended matter or oil comprising an introduction

means into which said water is charged, an inclined separation chamber having one end connected to said introduction means, a reservoir having an inlet end, said chamber having its other end connected to the inlet end of said reservoir, said separation chamber having a plurality of oblique partition plates disposed at regular spaced intervals and forming a plurality of passages,



said plates having an inclination corresponding generally to the inclination of said inclined separation chamber, said plates also having an inclination transverse to said inclination of said separation chamber, said reservoir having a bottom portion onto which suspended foreign material is settled, and an outlet attached to the bottom end of said separation chamber for discharging the clean water.

4,203,850

FOAM EXTINGUISHING AGENT

Peter Wirtz, Königstein, and Richard Bröll, Langen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 17, 1978, Ser. No. 925,368

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732555

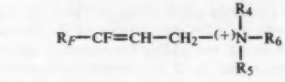
Int. Cl.[2] A62D *1/00*

U.S. Cl. 252—8.05 **5 Claims**

1. A fire extinguishing concentrate, based on water and a fluorinated surfactant as foam formers, which comprises:

(a) an amine oxide of the formula $R_1R_2R_3N\rightarrow O$, in which R_1 is alkyl of 4 to 20 carbon atoms and R_2 and R_3 are identical or different alkyls of 1 to 4 carbon atoms, and

(b) a fluorinated surfactant of the formula



$$R_F-CF=CH-CH_2-\overset{(+)}{N}(R_4)(R_5)-R_6 \quad (I)$$

in which R_F is perfluoroalkyl of 3 to 16 carbon atoms, R_4 is a hydrogen atom, C_{1-4} alkyl, cyclohexyl, or 2-hydroxyalkyl of 2 to 6 carbon atoms, R_5 is C_{1-4} alkyl, cyclohexyl, or 2-hydroxyalkyl of 2 to 6 carbon atoms, and R_6 is a water solubilizing radical.

4,203,851

FABRIC SOFTENING COMPOSITIONS AND METHODS FOR MANUFACTURE THEREOF

Pallassana N. Ramachandran, Robbinsville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 16, 1978, Ser. No. 916,072

Int. Cl.[2] D06M *13/34*

U.S. Cl. 252—8.6 **23 Claims**

1. A free-flowing particulate fabric softening composition comprising base beads impregnated with about 15 to 150% of the base beads weight of a normally solid, cationic quaternary ammonium softening agent selected from the group consisting of salts of the formula $[R^1R^2R^3R^4N]^+X^-$ wherein R^1 is an organic radical of 8 to 22 carbon atoms, R^2 and R^3 each represent C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl groups, R^4 is an organic radical of the type like R^1 or R^2 or R^3 and X is an anion and of imidazolinium compounds wherein a C_8–C_{22} alkyl group is substituted on the ring and on the quaternary nitrogen, said base beads having a particle size in the range of 8 mesh to 200 mesh U.S. Sieve Series, having a free volume from 30% to 80% and containing at least 70% by weight of an inorganic water-soluble and/or water-insoluble detergent builder selected from the group consisting of sodium aluminosilicates of calcium ion exchange capacity of at least 200 milligram equivalents per gram, pentasodium tripolyphosphate, sodium carbon-

ate, sodium bicarbonate and sodium silicate having an Na_2O to SiO_2 ratio in the range of 1:1.16 to 1:2.8 and mixtures thereof and containing from 0 to 15% by weight of water, with over 80% by weight of said softening agent being present within the interior of said base beads and the particles of said composition being of a size which pass a No. 8 U.S. Sieve and are retained by a No. 200 U.S. Sieve.

4,203,852

SOFTENER, BLEACH AND ANTI-CLING COMPOSITION

James R. Johnson, Highland Park, and William Chirash, New Providence, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 672,095, Mar. 31, 1976, abandoned, which is a continuation of Ser. No. 447,140, Mar. 1, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 750,325

Int. Cl.[2] D06M *11/04, 13/10, 13/34*

U.S. Cl. 252—8.8 **8 Claims**

1. A wash cycle fabric softener, bleach, and anti-cling powder, granular, pelleted or tabletted composition compatible with organic detergents consisting essentially of an inorganic peroxygen bleach compound blended with a cationic softening agent selected from the group consisting of hydrogenated ditallow dimethyl ammonium chloride, ethoxylated distearyl dimethyl ammonium chloride, dimethyl distearyl ammonium chloride, dimethyl distearyl ammonium bromide, dicoco dimethyl ammonium chloride, dimethyl arachidyl behenyl ammonium chloride, and disoyadimethyl ammonium chloride, in the weight ratio of 17:1 to 1:4 bleach to softening agent.

4,203,853

FLUID FOR RECOVERING HYDROCARBONS

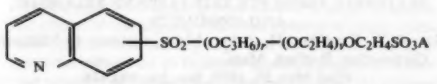
Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 825,313, Aug. 17, 1977, Pat. No. 4,127,171. This application May 25, 1978, Ser. No. 909,734

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D **2 Claims**

1. A fluid for use in recovering hydrocarbons comprising water containing from about 0.001 to about 0.50 weight percent of an interfacial tension reducer of the formula:



wherein r is an integer of from 2 to about 5, v is an integer of from 5 to about 60 and A is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion.

4,203,854

STABLE LUBRICANT COMPOSITION CONTAINING MOLYBDENUM DISULFIDE AND METHOD OF PREPARING SAME

Joseph J. Silverstein, Woodmere, N.Y., assignor to The Ore-Lube Corporation, New York, N.Y.

Continuation of Ser. No. 785,812, Apr. 8, 1977, abandoned, which is a continuation of Ser. No. 663,552, Apr. 8, 1977, abandoned, which is a continuation of Ser. No. 444,125, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 278,153, Aug. 4, 1972, abandoned. This application Sep. 5, 1978, Ser. No. 939,236

Int. Cl.[2] C10M *1/10*

U.S. Cl. 252—25 19 Claims

1. A stable lubricant composition for use as a motor oil which consists essentially of, by volume based upon the total volume of the lubricant composition, at least about 62 up to about 98.5 percent of a petroleum base oil; about 0.25 to about 1.25 percent of molybdenum disulfide particulates having a particle size in the range of about 0.15 to about 0.9 microns; about 0.60 to about 1.75 percent of an oil-soluble polymethacrylate viscosity index improver having a molecular weight in the range of about 100,000 to about 750,000; about 0.75 to about 3.00 percent of an anti-wear agent; and about 0.25 to about 2.00 percent corrosion inhibitor.

8. A stable concentrate suitable for preparing a lubricant composition for use as a motor oil by the addition of more petroleum base oil which concentrate consists essentially of, by volume, from about 20 to about 88 percent dispersion, from about 4 to about 13 percent corrosion inhibitor, from about 4 to 11.5 percent anti-wear agent and sufficient petroleum base oil, if needed, to make 100% by volume, said dispersion consisting essentially of, by volume, from about 5 to 15 percent MoS_2 particulates having a particle size in the range of about 0.15 to about 0.9 micron, from about 5 to 15 percent polymethacrylate viscosity index improver having a molecular weight in the range of about 100,000 to 750,000, and from about 70 to about 90 percent petroleum base oil.

12. A stable composition suitable for addition to a petroleum base motor oil to enhance the latter's properties as a motor oil, which composition consists essentially of, by volume, a dispersion of from about 5 to 15 percent MoS_2 particulates having a particle size in the range of about 0.15 to about 0.9 micron, from about 5 to 15 percent polymethacrylate oil-soluble viscosity index improver, and from about 70 to about 90 percent petroleum base oil.

4,203,855

PHENOXIDE-HALO CARBOXYLIC ACID CONDENSATE ADDITIVES FOR LUBRICANTS

Thomas F. Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 857,152, Dec. 5, 1977, Pat. No. 4,128,488, which is a continuation-in-part of Ser. No. 608,291, Aug. 27, 1975, Pat. No. 4,061,474. This application Dec. 4, 1978, Ser. No. 966,290

Int. Cl.[2] C10M *1/20, 1/38, 1/54*

U.S. Cl. 252—42.7 30 Claims

1. A composition made by reacting at least one (I) metal phenoxide substituted with at least one hydrocarbon-based group of at least about 30 carbon atoms with (II) a carboxylic acid reagent containing from 1 to about 3 carboxyl-based groups and a halogen-substituted hydrocarbon-based aliphatic or alicyclic group containing a halogen atom.

4,203,856

LUBRICANTS COMPRISING FLUOROALKYL ESTERS

Robert P. Pardee, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Continuation-in-part of Ser. No. 824,886, Aug. 15, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 924,025

Int. Cl.[2] C10M *3/24, 7/28;* D02G *3/00;* H01F *1/00*

U.S. Cl. 252—54.6 20 Claims

1. A method of lubricating an encoded surface of closely spaced grooves, said method comprising the steps of applying to the closely spaced grooves a homogeneous solution comprising about 3 weight percent or less of a fluoroalkyl ester and an organic carrier having an effective penetrating coefficient, and removing the organic carrier therefrom whereby a lubricous coating is deposited on said surface, said fluoroalkyl ester being derived from an aliphatic alcohol having the general formula $C_nF_{2n+1}(CH_2)_mOH$ wherein n is from 3 to 14 and m is 1 to 3 and an aliphatic carboxylic acid having from 2 to about 30 carbon atoms, said carrier having a surface tension of about 20 dynes or less per centimeter at 20° C.

4,203,857

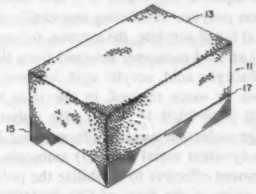
DETERGENT-SCRUBBER ARTICLE AND METHOD FOR MANUFACTURE

Bernard B. Dugan, Sandton, South Africa, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,243

Int. Cl.[2] C11D *9/00, 17/04*

U.S. Cl. 252—92 22 Claims



1. A detergent-scrubber article having a handle to facilitate application of detergent to items to be cleaned which comprises a solid body of detergent composition selected from the group consisting of synthetic organic detergents and soaps and mixtures thereof affixed to a substantially rigid body of light weight closed cell synthetic organic polymeric foam material which is functional as a scrubbing means for scrubbing soiled or stained surfaces of items to be cleaned after application of the detergent composition to such items and which is functional as a handle by means of which the body of solid detergent composition may be held while applying such composition to the items to be cleaned.

4,203,858

PHOSPHATE-FREE MACHINE DISHWASHING COMPOSITION

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 691,008, May 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 448,518, Mar. 6, 1974, abandoned. This application Oct. 17, 1977, Ser. No. 842,482

Int. Cl.[2] C11D *3/08, 3/10, 7/26*

U.S. Cl. 252—135 7 Claims

1. A phosphate-free, low foaming, machine dishwashing composition consisting essentially of, approximately by weight,:

(i) an alkali metal or ammonium carbonate;

(ii) a water soluble salt of a polyelectrolyte, selected from the group consisting of polyacrylic acid, polymethacrylic acid and their copolymers with each other, having a molecular weight of about 504 to 1291,

the weight ratio of (ii):(i) ranging from about 5:95 to about 20:80;

(iii) 0 to about 10% of a foam-suppressing non-ionic surfactant;

(iv) 0 to about 50% of an alkali metal silicate; and

(v) 0 to about 80% of an inert diluent selected from the group consisting of alkali metal chlorides, sulfates and nitrites.

4,203,859

SOLUBILIZED ACRYLIC POLYMERS AND CARPET SHAMPOOS CONTAINING THE SAME

William A. Kirn, Abington, and David R. Gehman, Harleysville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 810,216, Jun. 27, 1977, abandoned. This application Apr. 21, 1978, Ser. No. 898,571

Int. Cl.[2] C11D *3/37*

U.S. Cl. 252—174.23 15 Claims

1. An aqueous composition useful for imparting improved soil retardancy to a surface and adapted to modify a carpet shampoo, consisting essentially of: (1) a polymer component comprising an aqueous dispersion of a low molecular weight acrylic addition polymer consisting essentially of copolymerized units of (a) butyl acrylate, (b) styrene, (c) methyl methacrylate, and (d) an acid monomer selected from the group consisting of methacrylic acid, acrylic acid, itaconic acid and any mixture of two or more thereof, in the ratio by weight of a/b/c/d of 20–60/0–25/0–15/40–60, the polymer having a number average molecular weight of from about 2,500 to about 100,000; (2) polyvalent metal ions; (3) ammonia or a volatile amine in an amount effective to solubilize the polymer; and (4) optionally an anion in the form of $CO_3^{=}$, HCO_3^{-} or amino acid anion, in an amount effective to stabilize any complex formed with ingredients (2) and (3); the pka of the polymer component being less than about 6.7, there being no more than about 1 part of styrene to 1 part of butyl acrylate by weight, the pH of the composition being between about 7.5 and about 11, and there being at least about 0.8 equivalents of polyvalent metal ion per carboxyl group in the polymer and about 5–50% by weight of polymer solids in the composition.

4,203,860

NITROGEN-EMITTING COMPOSITION TO BE USED WITH FLASH GETTER MATERIALS

Wataru Ichise, Tokyo; Yasuo Kinjo, Yokohama; Kenji Enokida, and Hideharu Nihei, both of Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 355,345, Apr. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 179,057, Sep. 9, 1971, abandoned. This application May 5, 1975, Ser. No. 574,419

Claims priority, application Japan, Sep. 10, 1970, 45-78878

Int. Cl.[2] H01J *7/20*

U.S. Cl. 252—181.2 1 Claim

1. A nitrogen-emitting composition which is useful together with flash getter materials comprising a mixture consisting essentially of a major portion of Fe_4GeN and a minor portion of β-Ge_3N_4, which emits nitrogen when heated.

4,203,861

INORGANIC COMPOUNDS

Anthony J. Thorp, Immingham; Frank Clamp, Grimsby; Raoul Feld, Cleethorpes; Joseph E. Page-Gibson, Grimsby, and Keith Archer, Brigg, all of England, assignors to Laporte Industries Limited, London, England

Continuation-in-part of Ser. No. 856,605, Dec. 1, 1977, Pat. No. 4,137,297. This application Feb. 15, 1978, Ser. No. 878,159

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.[2] C01G *23/00;* H01M *4/58*

U.S. Cl. 252—182.1 43 Claims

1. Titanium disulphide particles comprising orthogonally intersecting interpenetrating plate segments.

26. A process for the manufacture of titanium disulphide comprising forming a dry oxygen-free reactant gas mixture having a mixed gas temperature as herein defined, above 400° C. and sufficient to enable the reaction to proceed and less than 500° C., the said mixture comprising titanium tetrachloride and hydrogen sulphide, the hydrogen sulphide being in an excess over the stoichiometric quantity for reaction with the titanium tetrachloride and the titanium tetrachloride and the hydrogen sulphide being separately preheated, passing the reactant gas mixture through a reaction zone as a gas stream having a velocity sufficient to entrain particles of titanium disulphide formed in the course of the reaction, subjecting the gas stream to a positive heat gradient in the reaction zone and recovering the particles of titanium disulphide from the entraining gases.

4,203,862

LIQUID CRYSTAL COMPOSITION

Ying-Yen Hsu, Bridgewater, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed Dec. 22, 1978, Ser. No. 972,556

Int. Cl.[2] C09K *3/34;* C02F *1/13*

U.S. Cl. 252—299 5 Claims

1. A nematic liquid crystal composition comprising:

4-cyanophenyl-4'-butylbenzoate: 15–30 mole%

4-cyanophenyl-4'-heptylbenzoate: 20–40 mole%

4-pentylphenyl-4'-pentylbenzoate: 20–35 mole%

4-pentylphenyl-4'-(4''-pentylbenzoyloxy)benzoate: 10–15 mole%

4-cyano-4'-pentylibiphenyl: 10–20 mole%

4,203,863

PROCESS FOR THE PRODUCTION OF SOLID PARTICLES

Karl Knotik, Eisenstadt; Peter Leichter; Emil Proksch, both of Vienna, all of Austria, and Hans Huschka, Hanau, Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,383
Claims priority, application Austria, May 24, 1977, 3696/77
Int. Cl.[2] G21F 9/08
U.S. Cl. 252—301.1 W 10 Claims

1. A process for the production of solid particles of bioinjurious radioactive liquid waste comprising dividing the waste into drops and supplying energy to the drops in a non-turbulent gaseous medium to evaporate the liquid, the energy being supplied by irridiation, to form solid dust-free particles from the drops.

4,203,864

METHOD OF FORMING LOW TEMPERATURE DISPERSIONS

Edgar W. Sawyer, Jr., Hagerstown, Md., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 696,142, Jun. 14, 1976, abandoned. This application Dec. 30, 1977, Ser. No. 866,094
Int. Cl.[2] B01J 13/00
U.S. Cl. 252—314 6 Claims

1. A method of forming an aqueous dispersior of solid particles having a depressed freezing point, comprising the steps of:
dissolving a condensed phosphate dispersant in water in an amount equal to 0.2 to 4.0% by weight of solid particles to be added;
mixing urea into the water containing the dispersant in an amount equal to 3 to 30% by weight of the dispersion;
adding solid particles to the mixture in an amount equal to 20 to 75% by weight of the dispersion; and
adding an antifreeze solution selected from the group consisting of methanol, ethanol, isopropanol, ethylene glycol and propylene glycol to the dispersion in an amount equal to 9 to 30% by weight of the dispersion to depress the freezing point of the dispersion without flocculating the solid particles.

4,203,865

METHOD AND A CATALYST FOR THE OXIDATION OF A CONJUGATED DIOLEFIN

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 676,258, Apr. 12, 1976, Pat. No. 4,099,018. This application May 2, 1978, Ser. No. 902,192
Int. Cl.[2] B01J 27/08, 27/10
U.S. Cl. 252—429 R 9 Claims

1. In a composition comprising a lead compound, the improvement comprising an alkali metal compound and a halogenated olefin having a halogen radical in the allylic position in combination with said lead compound, wherein the alkali metal compound is a member of the group consisting of salts, oxides and mixtures thereof and the halogenated olefin is present in an amount of from about 0.1 to about 10 moles per mole of lead compound.

4,203,866

CHEMICAL COMPOSITIONS BASED ON TITANIUM TRIHALIDES AND METHODS FOR THEIR PRODUCTION AND USE

Margherita Corbellini, Milan; Alberto Greco, Dresano, and Mirko Oselame, Ombriano, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Jun. 16, 1978, Ser. No. 915,998
Claims priority, application Italy, Jun. 30, 1977, 25232 A/77
Int. Cl.[2] C08F 4/64
U.S. Cl. 252—429 C 10 Claims

1. A chemical composition based on a titanium trihalide and at least one other halide of a metal selected from the group consisting of Al, Cr, Mn, Fe, V, Ti, Zr, Mo, Zn and Ca, when prepared by reacting a titanium compound having a valency higher than three and the vapors of at least one metal selected from said group in the presence of a halogen-donor compound.

4,203,867

TRANSITION METAL COMPOSITION AND PRODUCTION THEREOF

Ashley D. Bye, Hague, Netherlands, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 25, 1978, Ser. No. 936,892
Claims priority, application United Kingdom, Aug. 31, 1977, 36343/77; May 24, 1978, 21733/78
Int. Cl.[2] C08F 4/64
U.S. Cl. 252—429 B 15 Claims

1. A composition of matter which is of the formula:

$$TiCl_3(AlR_xX_{3-x})_nE_aL_b$$

where
R is a hydrocarbyl group;
X is a halogen atom other than fluorine;
E is a hydrocarbyl ether or a hydrocarbyl thioether;
x is such that $0<x<3.0$;
n is from 0 up to 0.5;
a and b are each, independently, from 0.001 up to 0.50; and
L is an organic Lewis Base compound selected from esters of the formula

$$R^1R^2R^3CCOOR^1;$$

hydrocarbyl esters and partial esters of aliphatic hydrocarbyl diols and hydrocarbyl polyols; amines of the formula

$$R^4R^5R^6N;$$

and ketones of the formula

$$R^7—\overset{\overset{O}{\|}}{C}—R^8$$

where
R^1 is a hydrocarbyl group;
R^2 and R^3 are each, independently, a hydrogen atom or a hydrocarbyl group; or the group $R^1R^2R^3C—$ is an unsubstituted or hydrocarbyl substituted, saturated or unsaturated, condensed or uncondensed hydrocarbyl ring system;
R^4 and R^5 are hydrocarbyl groups;
R^6 is a hydrogen atom, a hydrocarbyl group or a group

$$—C_mH_{2m}NR^4R^5;$$

or R^4 and R^5, optionally together with R^6, together form an unsubstituted, condensed or uncondensed hydrocarbyl ring system;
R^7 is a hydrocarbyl group;
R^8 is a hydrocarbyl group, which may optionally be substituted with one hydrocarbonoxy-group; and
m is 1, 2 or 3.

4,203,868

PROCESS FOR PREPARING CARBON WHICH ADSORBS METAL IONS

Geert J. deJong, Boekelo, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 13, 1978, Ser. No. 915,242

Claims priority, application Netherlands, Jun. 22, 1977, 7706879

Int. Cl.[2] B01J *27/02, 31/02*

U.S. Cl. 252—439 6 Claims

1. A process for the preparation of a solid carbon-containing material having a sorption capacity for metal ions which comprises mixing a carbon-containing starting material with sulphur, heating the resulting mixture at a temperature in the range of about 120° to 500° C. and subsequently heating the resulting product and an aqueous solution containing an alkali metal hydroxide at a temperature of up to about 200° C.

4,203,869

ZSM-5 CONTAINING ALUMINUM-FREE SHELLS ON ITS SURFACE

Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 868,147, Jan. 9, 1978, Pat. No. 4,148,713, which is a continuation-in-part of Ser. No. 726,353, Sep. 24, 1976, Pat. No. 4,088,605. This application Dec. 1, 1978, Ser. No. 965,656

The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z 7 Claims

1. A crystalline aluminosilicate zeolite having an aluminum-free outer shell of SiO_2, said outer shell having the same crystal structure as said zeolite.

3. The crystalline aluminosilicate zeolite of claim 1 having the crystal structure of ZSM-5, ZSM-11, ZSM-12 or ZSM-35.

4,203,870

CATALYST FOR HYDROGENATION OF GLYCOLIC ACID

Donald R. Nielsen, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 896,944, Apr. 17, 1978, Pat. No. 4,141,930. This application Nov. 6, 1978, Ser. No. 958,074

Int. Cl.[2] B01J *29/10*

U.S. Cl. 252—459 3 Claims

1. A catalyst, especially suited for use in catalyzing the liquid phase hydrogenation of glycolic acid to produce ethylene glycol, consisting essentially of metallic cobalt and from about 5 to 20 percent by weight of thorium oxide based on the combined weights of metallic cobalt and thorium oxide.

3. The catalyst of claim 1 carried on a particulate support containing at least about 80 percent silica.

4,203,871

METHOD OF MAKING LEAD AND BISMUTH RUTHENATE AND IRIDATE PYROCHLORE COMPOUNDS

Harold S. Horowitz, Clark; John M. Longo, New Providence, and Joseph T. Lewandowski, Middlesex, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 856,648, Dec. 2, 1977, Pat. No. 4,129,525. This application Nov. 1, 1978, Ser. No. 956,744

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—518 21 Claims

1. A method of preparing compounds having the formula:

$$A_2[B_{2-x}A_x]O_{7-y}$$

wherein A is selected from the group consisting of lead, bismuth and mixtures thereof, wherein B is selected from the group consisting of ruthenium, iridium and mixtures thereof, wherein x is a value such that $0 > x > 1.0$ and y is a value such that $0 > y > 1$, comprising:

(a) reacting A cations and B cations from an aqueous solution in a liquid reaction medium having a pH which is equal to or greater than about 4.5 and less than about 13.5, in the presence of oxygen source at a temperature below about 200° C. for a sufficient time for reaction to occur; and, if amorphous reaction products are obtained,

(b) subsequently heat treating the reaction products at a temperature of about 200° C. to about 600° C. for a time to convert amorphous reaction products to crystalline pyrochlore reaction product.

4,203,872

SURFACTANT SYSTEM

John J. Flanagan, 8950 S. Leavitt Ave., Chicago, Ill. 60620

Continuation-in-part of Ser. No. 862,595, Dec. 20, 1977, and Ser. No. 601,054, Aug. 1, 1975, Pat. No. 4,065,409, Ser. No. 832,364, Sep. 12, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,134

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.[2] C11D *1/75, 1/825, 1/835, 1/94*

U.S. Cl. 252—542 5 Claims

1. A surfactant system comprising:

A. about 25–75% by weight of a non-ionic detergent which is a mixture of about 25% by weight of a condensation product of 4–5 moles of ethylene oxide with 1 mole of nonyl phenol, and about 75% by weight of a condensation product of 8–12 moles of ethylene oxide with 1 mole of nonyl phenol;

B. about 5–65% by weight of

(1) a tertiary amine oxide selected from the group consisting of

(a) alkyl di (lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

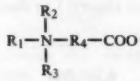
(b) alkyl di (hydroxy lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and contains from 0 to 1 ether linkages and has one alkyl moiety which contains from about 10 to 15 carbon atoms and no ether linkages, and the lower alkyl groups have about 1–7 carbon atoms;

(c) alkylamidopropyl di (lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms; and

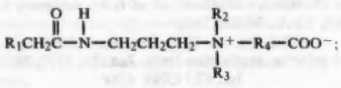
(d) alkyl morpholine oxides in which the alkyl group has about 10–20 carbon atoms; or

(2) an amphoteric detergent selected from the group consisting of

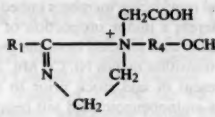
(a) betaine detergents having the formula



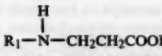
(b) alkyd bridged betaine detergents having the formula



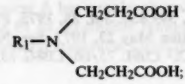
(c) imidazoline detergents having the formula



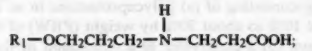
(d) alkyliminopropionate detergents having the formula



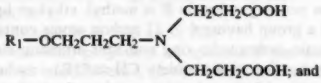
(e) alkyliminodipropionate detergents having the formula



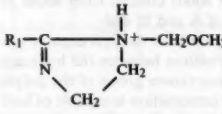
(f) ether bridged alkyliminopropionate detergents having the formula



(g) ether bridged alkyliminodipropionate detergents having the formula



(h) cocoimidazoline based amphoteric detergents having the formula



wherein

R_1 is an alkyl radical containing from about 10 to about 14 carbon atoms,

R_2 and R_3 are each selected from the group consisting of methyl and ethyl radicals, and

R_4 is selected from the group consisting of methylene, ethylene and propylene radicals;

C. about 8–50% by weight of a quaternary ammonium halide having the formula

wherein X is a halide and wherein R_5 is an alkyl or phenyl-substituted alkyl group having about 10–20 carbon atoms, R_6 is lower alkyl, R_7 is $[-CH_2CH_2O-]_xH$, and R_8 is $[-CH_2CH_2O-]_yH$, wherein the sum of x and y is between 2 and 5; and

D. the remainder water.

5. A method for emulsifying vegetable oil and petroleum oils, said method including the steps of preparing a surfactant system comprising

A. about 25–75% by weight of a non-ionic detergent which is a condensation product of about 4–16 moles of ethylene oxide with one mole of a compound selected from the group consisting of

(1) an alkyl phenol having about 7–10 carbon atoms in the alkyl group;

(2) an alkyl amine having about 12–16 carbon atoms in the alkyl group;

(3) an aliphatic alcohol having about 10–20 carbon atoms; and

(4) a hydrophobic base formed by condensing propylene oxide with propylene glycol; and

B. about 5–65% by weight of

(1) an amine oxide selected from the group consisting of

(a) alkyl di (lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

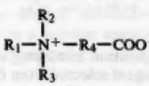
(b) alkyl di (hydroxy lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and contains from 0 to 2 ether linkages and has one alkyl moiety which contains from about 10 to 15 carbon atoms and no ether linkages, and the lower alkyl groups have about 1–7 carbon atoms;

(c) alkylamidopropyl di (lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms; and

(d) alkyl morpholine oxides in which the alkyl group has about 10–20 carbon atoms; or

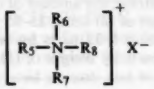
(2) an amphoteric detergent selected from the group consisting of

(a) betaine detergents having the formula



said method comprising the step of adding to said aqueous solution

C. about 8–50% by weight of a quaternary ammonium halide having the formula



wherein X is a halide and the quaternary ammonium radical is selected from the group consisting of

(1) radicals wherein R_5 and R_6 are lower alkyl, R_7 is a lower alkyl group or a benzyl group, and R_8 is an alkyl group having about 1–18 carbon atoms substituted with a phenyl group, or an alkyl group having about 8–20 carbon atoms;

(2) radicals wherein R_5, R_6 and R_7 are lower alkyl, and R_8 is an alkyl or phenyl-substituted alkyl group having about 8–20 carbon atoms; and

(3) radicals wherein R_5 is an alkyl or phenyl-substituted alkyl group having about 10–20 carbon atoms, R_6 is lower alkyl, R_7 is $[-CH_2CH_2O-]_xH$, and R_8 is $[-CH_2CH_2O-]_yH$, wherein the sum of x and y is between 2 and 5,

said method further comprising

D. combining 1 part by weight of said surfactant system with from about 1 to about 3 parts by weight of alkaline builders and with up to about 100 parts by weight of water to provide a detergent concentrate;

E. diluting 1 part by weight of said detergent concentrate

with up to about 50 parts by weight of water to provide a detergent solution, and

F. mixing said detergent solution and oil to emulsify the oil within said solution.

4,203,873

ANIONIC DETERGENT COMPOSITION CONTAINING A BUILDER MIXTURE COMPRISING AN IMIDOBIS-SULFATE AND SODIUM CITRATE OR NITRILOTRIACETATE

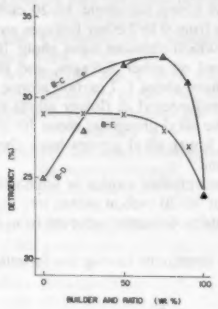
Hiroshi Suzuki, Mitaka; Yukio Ito, Tokyo; Yosiro Yasumoto, Fuchu; Sigeru Kinomura, and Kazuo Nagashima, both of Yokohama, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 753,777, Dec. 23, 1976, abandoned. This application Aug. 24, 1978, Ser. No. 936,599

Claims priority, application Japan, Dec. 23, 1975, 50-153537

Int. Cl.[2] C11D *3/34, 1/12*

U.S. Cl. 252—545 **5 Claims**



1. A detergent composition consisting essentially of (1) an anionic surface active agent selected from the group consisting of sodium linear alkylbenzene sulfonate, sodium higher alcohol sulfate, sodium higher alcohol ethoxy sulfate, sodium olefin sulfonate and their corresponding potassium and ammonium salts; (2) an imidobissulfate of the general formula $(MSO_3)_2NM$ in which M is a cation selected from the group consisting of sodium, potassium and ammonium; and (3) at least one compound selected from the group consisting of sodium nitrilotriacetate and sodium citrate; the amount of (1) being 25–65 parts by weight, the amount of (2) being 25–65 parts by weight and the amount of (3) being 5–35 parts by weight, said amounts being based on 100 parts by weight of (1), (2) and (3).

4,203,874

METHOD, COMPOSITION AND PRODUCT WITH IMPROVED ADHESION BETWEEN A METAL MEMBER AND A CONTIGUOUS CURED RUBBER SKIM STOCK

Adel F. Halasa, Bath; Frederick J. Ravagnani, Uniontown, and Steven E. Schonfeld, Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 866,973, Jan. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,767, Aug. 15, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,540

Int. Cl.[2] C08K *5/18;* **C08L** *7/00, 9/00*

U.S. Cl. 260—3 **12 Claims**

1. In a cured rubber skim stock of conventional composition containing vulcanizable rubber, said stock being bonded to at least one metal member contained within said stock, the improvement wherein a minor proportion of a transition salt of para-aminobenzoic acid is present in said stock prior to curing, said minor amount of para-aminobenzoic acid salt being an appropriate amount to secure improved rubber-to-metal adhesion.

9. A tire having improved adhesion between a cured rubber skim stock of conventional composition containing vulcanizable rubber, and, metal reinforcing members imbedded therein, the improvement wherein a minor proportion of a transition salt of para-aminobenzoic acid selected from the group consisting of the salts of the transition metals Ni, Cr, Mn, Zn, Mo, Cd, Zr, Ag and Ti is present in said stock prior to curing, said minor amount of para-aminobenzoic acid salt being an appropriate amount to secure improved rubber-to-metal adhesion.

4,203,875

HIGH SOLIDS URETHANES AND APPLICATION THEREOF

James W. Garner, Farmington Hills, and Robert G. Kelso, Southfield, both of Mich., assignors to Grow Chemical Corp., New York, N.Y.

Division of Ser. No. 599,833, Jul. 28, 1975, Pat. No. 4,070,509. This application May 23, 1977, Ser. No. 799,179

Int. Cl.[2] C08L *75/06;* **C08G** *18/42*

U.S. Cl. 260—13 **14 Claims**

1. A polymerizable protective heat curable thermosetting coating composition comprising:

A. a polyol composition consisting essentially of (1) a polymerized low molecular weight polyol selected from the group consisting of (a) polycaprolactone in an amount of about 10% to about 50% by weight (PBW) of the polyol portion; (b) a copolymer of a compound of the formula $CH_2{=}C(R){-}R^1$ and allyl alcohol in an amount of 10 to 50 PBW of the polyol portion; and (c) mixtures thereof; and (2) a saturated aliphatic polyol from 4 to 12 carbon atoms or a saturated cycloaliphatic polyol of from 5 to 8 carbon atoms per ring; wherein R is methyl, ethyl or hydrogen; R^1 is a group having 6 to 12 carbon atoms containing an aromatic carbocyclic ring and said aromatic ring is directly bonded to the moiety $CH_2{=}C(R){-}$; wherein the polymerized low molecular weight polyol of (A) has at least three functional groups per molecule;

B. a polyisocyanate; wherein the ratio of NCO/OH of A and B ranges from about 0.9 to 1.2; the coating composition having a range of solids content from about 40 to about 100% by weight of A and B; and

C. a compatible polyurethane catalyst capable of catalyzing the cross-linking reaction between the hydroxyl group of a polyol and the isocyanate group of the polyisocyanate;

wherein the coating composition is capable of heat curing to a cross-linked coating at a temperature-time range of from about 130° to about 180° F. for a period of time ranging from about 15 minutes to about 60 minutes to achieve a Tukon hardness of at least 3 within 24 hours.

4,203,876

MOLDABLE COMPOSITIONS BASED ON THERMOPLASTIC POLYMERS, SYNTHETIC ELASTOMERS AND VEGETABLE FIBROUS MATERIALS, AND USE OF THESE COMPOSITIONS FOR CALENDERING AND THERMOFORMING

Michel Dereppe, Brussels, and Jean Leva, Limelette, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Feb. 23, 1978, Ser. No. 880,486

Claims priority, application France, Feb. 28, 1977, 77 06029

Int. Cl.[2] C08L *23/04*

U.S. Cl. 260—17.4 R **10 Claims**

1. Moldable composition consisting essentially of a thermoplastic polyolefin and vegetable materials, wherein the composition furthermore contains a synthetic elastomer.

4,203,877

BLOCK OR GRAFT COPOLYMERS AND THEIR USE AS SURFACTANTS

Alan S. Baker, Slough, England, assignor to Imperial Chemical Industries Limited, London, England

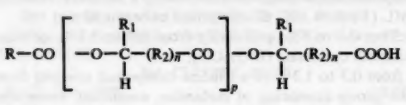
Filed Jul. 3, 1978, Ser. No. 921,563

Claims priority, application United Kingdom, Jul. 12, 1977, 29192/77

Int. Cl.[2] C08G *65/26*; C08L *67/00*

U.S. Cl. 260—18 R **22 Claims**

1. A copolymer suitable for use as a surfactant in a system consisting of an oil phase and an aqueous phase, the copolymer containing at least two polymeric components which are derived from oil-soluble complex monocarboxylic acids and another polymeric component which is the residue of a water-soluble compound containing polyoxyalkylene chains, characterized in that the copolymer has the general formula $(A—COO)_m—B$, wherein m is an integer at least 2, wherein each polymeric component A has a molecular weight of at least 500 and is the residue of an oil-soluble complex monocarboxylic acid having the general structural formula



(I)

in which

R is hydrogen or a monovalent hydrocarbon or substituted hydrocarbon group;

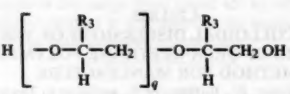
R_1 is hydrogen or a monovalent C_1 to C_{24} hydrocarbon group;

R_2 is a divalent C_1 to C_{24} hydrocarbon group;

n is zero or 1;

p is an integer from zero up to 200;

and wherein each polymeric component B has a molecular weight of at least 500 and, in the case where m is 2, is the divalent residue of a water-soluble polyalkylene glycol having the general formula



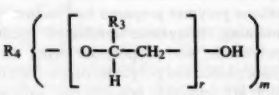
(II)

in which

R_3 is hydrogen or a C_1 or C_3 alkyl group;

q is an integer from 10 up to 500;

or in the case where m is greater than 2, is the residue of valency m of a water-soluble polyether polyol having the general formula

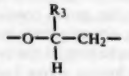


(III)

in which

R_3 and m have their previous significance;

r is zero or an integer from 1 to 500, provided that the total number of



units in the molecule is at least 10;

R_4 is the residue of an organic compound containing in the molecule m hydrogen atoms reactive with an alkylene oxide.

4,203,878

EPOXY RESIN TRAFFIC PAINT COMPOSITIONS

Ronald S. Bauer, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 2, 1978, Ser. No. 930,482

Int. Cl.[2] C09D *3/58*, *3/76*

U.S. Cl. 260—18 EP **11 Claims**

1. A meltable, extrudable, solventless traffic marking composition free of epoxy curing agent comprising (1) an adduct of (a) at least one glycidyl polyether of polyhydric phenols and (b) a polymeric fatty acid, (2) a thermoplastic resin and (3) one or more pigments.

4,203,879

PLASTISOL RESINS HAVING IMPROVED CLARITY

Raymond C. DeWald, Douglassville; Ronald M. Ellis, and Stephen T. Fitzpatrick, both of Pottstown, all of Pa., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 1, 1978, Ser. No. 939,035

Int. Cl.[2] C08L *91/00*, *27/06*

U.S. Cl. 260—23 XA **26 Claims**

1. A method for improving the clarity of plastisol resin films prepared from a monomer selected from the group consisting of vinyl chloride and other monomers copolymerizable therewith comprising the sequential steps of:

polymerizing the desired monomeric ingredients and an aqueous phase in a suitable reactor to yield a latex, said aqueous phase comprising

water;

an anionic surfactant;

a fatty compound; and

an oil soluble free radical forming initiator;

dissolving a nonionic emulsifier in said latex and blending to form a uniform mixture;

spray drying said mixture to yield a resin containing said nonionic emulsifier said nonionic emulsifier having the formula $R—O—(CH_2CH_2O)_n H$ and R is selected from the group consisting of fatty acids polyol fatty acid esters, fatty alcohols, fatty amines, fatty amides, polypropylene oxides and alkylated phenols and N is an integer ranging from 1 to about 50;

forming a paste with said resin and a suitable plasticizer with mixing; and thereafter

fusing a layer of said paste with heat to form a clear film.

15. A plastisol resin film product comprising: a polymer resin comprising

100 parts of a monomer selected from the group consisting of vinyl chloride, other monomers copolymerizable therewith and mixtures thereof;

from about 0.5 to about 3.0 parts of an anionic surfactant, per 100 parts of monomer;

from about 0.01 to about 0.1 parts of an oil soluble initiator, per 100 parts of monomer; and

from about 0.5 to about 3.0 parts of a fatty alcohol, per 100 parts of monomer; a plasticizer; and

from about 0.1 to about 5.0 parts per 100 parts of resin of at least one nonionic emulsifier having the formula $R—O—(CH_2CH_2—O)_nH$ wherein R is selected from the group consisting of fatty acids, polyol fatty acid esters, fatty alcohols, fatty amines, fatty amides, polypropylene oxides and alkylated phenols, and n is an integer ranging from 1 to about 50.

4,203,880

LUBRICANT COMPOSITION FOR HALOGEN-CONTAINING POLYMERS

Alfred Stoloff, Livingston, and Anthony L. Williams, Summit, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Nov. 13, 1978, Ser. No. 959,707
Int. Cl.[2] C08F *10/02, 14/06;* C08J *3/18*
U.S. Cl. 260—23 XA 22 Claims

1. A composition for improving the melt strength and processability of polymers formed from at least one halogen-containing ethylenically unsaturated compound, said composition comprising (1) an effective amount of a heat stabilizer for said polymers, (2) an effective amount of an external lubricant for said polymers, said lubricant being selected from the group consisting of paraffin oils, paraffin waxes, liquid and solid hydrocarbons and non-oxidized polyethylene waxes, and (3) an oxidized polymer wherein at least 50% of the repeating units are derived from ethylene and any remaining repeating units are derived from at least one α-olefin containing from 3 to 10 carbon atoms, wherein said oxidized polymer exhibits an acid number greater than 5 and a melt viscosity of from 1,000 to about 60,000 centipoises at a temperature of 140° C.

12. A halogen-containing polymer composition exhibiting improved melt strength and processability, said composition comprising (1) a halogen-containing polymer selected from the group consisting of homopolymers of vinyl chloride or vinylidene chloride and copolymers of vinyl chloride and vinylidene chloride with one another or with at least one copolymerizable ethylenically unsaturated compound, (2) an effective amount of a heat stabilizer for said halogen-containing polymer, (3) an effective amount of an external lubricant for said halogen-containing polymer, said lubricant being selected from the group consisting of paraffin oils, paraffin waxes, liquid and solid hydrocarbons and non-oxidized polyethylene waxes, and (4) from 0.05 to 1.5%, based on the weight of said halogen-containing polymer, of an oxidized polymer wherein at least 50% of the repeating units are derived from ethylene and any remaining repeating units are derived from at least one α-olefin containing from 3 to 10 carbon atoms, wherein said oxidized polymer exhibits an acid number greater than 5 and a melt viscosity of from 1,000 to about 60,000 centipoises at a temperature of 140° C.

4,203,881

POINTING COMPOUND

Peter Klezl, Vienna, Austria, assignor to ÖMV Aktiengesellschaft, Vienna, Austria

Filed Sep. 29, 1978, Ser. No. 947,060
Claims priority, application Austria, Oct. 4, 1977, 7058/77
Int. Cl.[2] C08L *23/06, 23/12, 23/16, 91/00*
U.S. Cl. 260—28.5 A 7 Claims

1. A composition of matter useful as a pointing compound comprising a mixture of:

(a) a mildly air-blown bitumen of the >B 70 standard type;

(b) at least 25% by weight of an amorphous polyolefin selected from polypropylene, polyethylene, and copolymers of propylene and ethylene having a molecular weight in the range of from 25,000 to 30,000, having a viscosity at 170° C. of 2,000 to 5,000 cp., a ring and ball softening point of 115°–125° C. and a penetration at 25° C. of 30 to 40 1/10 mm; and

(c) from 10% to 40% by weight of a high-boiling aromatic mineral oil having a viscosity in the range of 5–6 E°/20° C. (MD I) to 7–8 E°/100° C. (MD V).

4,203,882

SELF-EXTINGUISHING POLYMERIC COMPOSITIONS BASED ON MODIFIED POLYPROPYLENE

Guido Bertelli; Pierpaolo Roma, and Renato Locatelli, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 24, 1978, Ser. No. 954,206
Claims priority, application Italy, Oct. 27, 1977, 29042 A/77
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 A 5 Claims

1. Impact resistant polymeric compositions endowed with flame-resistance properties, comprising as the essential components:

(1) a blend consisting of (a) 95–80% by weight of a thermoplastic propylene-ethylene block copolymer containing from 3 to 20% by weight of copolymerized ethylene and having a flow index, measured at 230° C. according to ASTM D 1238 condition L standards, between 0.2 and 1, and an elasticity modulus at 23° C., measured according to ASTM D 790 standards, of at least 1100 MN/m^2, and (b) from 5–20% by weight of an elastomeric ethylene-propylene copolymer containing from 50 to 70% by weight of copolymerized ethylene and having a Mooney viscosity ML (1+4) at 100° C. comprised between 50 and 100;

(2) from 0.5 to 5%, preferably from 0.9 to 1.7%, of basic bismuth carbonate $(BiO)_2CO_3$;

(3) from 0.3 to 1.3% of a triazine compound selected from the group consisting of melamine, ammeline, ammelide, acetoguanamine, benzoguanamine and isocyanuric acid;

(4) from 2 to 10% of a chlorinated paraffin wax containing from 40 to 70% by weight of chlorine;

(5) from 0.5 to 10% of a brominated organic compound selected from the group consisting of decabromodiphenyl oxide, octabromodiphenyl oxide, pentabromodiphenyl oxide, 1,2-bis(2,4,6-tribromo-phenoxy)ethane, pentabromophenol, pentabromotoluene and ethyl-pentabromobenzene;

the total quantity of the two halogenated additives ranging from 5 to 15% and all the percentages of anti-flame additives being referred to the total weight of the composition.

4,203,883

AQUEOUS COLLOIDAL DISPERSIONS OF TERTIARY AMINE SALTS OF UREA-URETHANE POLYMERS AND METHOD FOR MANUFACTURE

David G. Hangauer, Jr., Buffalo, N.Y., assignor to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 729,091, Oct. 4, 1976, abandoned. This application Sep. 5, 1978, Ser. No. 939,667
Int. Cl.[2] C08L *75/04*
U.S. Cl. 260—29.2 TN 67 Claims

1. A stable, aqueous colloidal dispersion of urea-urethane polymer salt which dispersion is infinitely dilutable with water, and which polymer salt consists essentially of tertiary amine salt of urea-urethane polymer prepared by reaction of carboxylic group-containing, isocyanate-terminated urethane prepolymer and polyamine, said prepolymer being the reaction product of polyisocyanate and polyol having sufficient carboxylic groups which are relatively non-reactive with isocyanate to provide said prepolymer with an acid value of about 17 to 60 on an unneutralized solids basis, said polyisocyanate being selected from the group consisting of aliphatic diisocyanates, alicyclic diisocyanates, toluene diisocyanate and xylene diisocyanate and said polyamine consisting essentially of triamine, wherein said polyamine components have at least two amine groups selected from the group consisting of primary amine groups and secondary amine groups reactive with isocyanate groups, said polyamine having on the average at least about 2.2 amine nitrogen atoms having active hydrogen per molecule of polyamine, said polymer salt having sufficient carboxylic groups in tertiary amine salt form to provide said stable, aqueous, colloidal dispersion.

4,203,884

THERMOPLASTIC COMPOSITIONS OF POLYNORBORNENE AND POLYOLEFIN RESIN

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 19, 1979, Ser. No. 31,576
Int. Cl.[2] C08L *23/06, 23/12*
U.S. Cl. 260—33.6 AQ 36 Claims

1. A composition comprising a blend of about 1–99 parts by weight of thermoplastic crystalline polyolefin resin, about 99–1 parts by weight of polynorbornene per 100 total parts by weight of polyolefin resin and polynorbornene, and sufficient plasticizer to lower the glass transition temperature of the polynorbornene to within the rubbery range.

4,203,885

PROCESS FOR THE MONONITRATION OF ANTHRAQUINONE

Walter Hohmann; Klaus Wunderlich, both of Leverkusen, and Helmut Seidler, Bonn-Bad Godesberg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 835,938, Sep. 22, 1977, abandoned. This application Oct. 18, 1978, Ser. No. 952,358
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646649
Int. Cl.[2] C07C *49/68*
U.S. Cl. 260—369 13 Claims

1. Process for the preparation of 1-nitro-anthraquinone with yields of about 74 to 80% relative anthraquinone employed, by the mononitration of anthraquinone with nitric acid/sulphuric acid mixtures, which consists of nitrating anthraquinone in a nitric acid/sulphuric acid mixture in a two phase system consisting of a liquid organic phase and a liquid inorganic phase, in which the weight ratio of nitric acid to sulphuric acid is about 1:1 to about 2:1, in which the weight ratio of sulphuric acid to anthraquinone is about 0.5:1 to about 1:1 and in which the weight ratio of sulphuric acid to water is about 2.5:1 to about 5.1:1, the weight ratios relating to the sum of the materials employed, the nitric acid being employed in a concentration of about 90 to 100% by weight and the sulfuric acid being employed in a concentration of about 70 to 85% by weight at temperatures in the range from about 45° to 70° C. until the anthraquinone content is less than 3% by weight, relative to the sum of the anthraquinone compounds.

4,203,886

FLAME-RETARDANT SILICONE COMPOSITION HAVING X-RAY SHIELDING ABILITY

Akira Hirai; Kazuyuki Nishimoto, both of Katano, and Hisataka Kuroki, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 30, 1978, Ser. No. 955,757
Claims priority, application Japan, Nov. 15, 1977, 52-137535
Int. Cl.[2] C08K *3/30, 3/24, 3/16*
U.S. Cl. 260—37 SB 10 Claims

1. A flame-retardant silicone composition having X-ray shielding ability characterized in that at least one of barium titanate, barium fluoride and lead sulfate is incorporated as an X-ray shielding substance in a silicone composition containing platinum or a platinum compound as a flame-retardant.

4,203,887

MODIFIED POLYESTER COMPOSITION

Edwin J. Goedde, Mt. Vernon, Ind.; Fred F. Holub, Schenectady, N.Y., and Phillip S. Wilson, Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 19, 1978, Ser. No. 870,679
Int. Cl.[2] C08K *3/36, 7/14, 9/06;* C08L *67/02*
U.S. Cl. 260—40 R 17 Claims

1. A thermoplastic composition comprising:

(a) a polyester composition comprising, in intimate admixture, a poly(1,4-butylene terephthalate) resin and a poly-(ethylene terephthalate) resin and

(b) an amount of up to 60 parts per 100 parts by weight of (a) and (b) of a modifier therefor comprising:

(i) a silane-treated clay;

(ii) acicular calcium metasilicate;

(iii) a combination of a segmented copolyester and an aromatic polycarbonate; or

(iv) novaculite, or a mixture thereof, said composition being more readily moldable to articles having improved dimensional stability in comparison with the corresponding compositions wherein the modifer is not present.

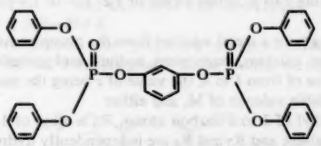
4,203,888

POLYESTER FILMS

Robert B. Rashbrook, Hatfield, England, assignor to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 488,232, Jul. 12, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,779
Claims priority, application United Kingdom, Mar. 5, 1974, 9823/74
Int. Cl.[2] C08K *5/51*
U.S. Cl. 260—45.7 P 6 Claims

1. A polyester composition which comprises a linear polyester as the main component and from 5 to 20% by weight based on the polyester, of an organic diphosphate of the formula:



4,203,889

POLYURETHANE COMPOSITIONS STABILIZED WITH KETOXIMES

Eugene Y. C. Chang, and Samuel Kaizerman, both of Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 371,816, Jun. 20, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 534,026
Int. Cl.[2] C08K *5/34*
U.S. Cl. 260—45.8 NT 22 Claims

1. A polyurethane containing a stabilizing amount of a mixture of co-operative amounts of (1) an organic oxime selected from the group consisting of acetoxime and cyclohexanone oxime, (2) an ultraviolet light absorber selected from the group consisting of 2,2'-dihydroxy-4-methoxybenzophenone and 2-(2-hydroxy-3,5-di-t-butylphenyl)-5-chlorobenzotriazole and (3) a phenolic antioxidant selected from the group consisting of 2,2'-methylenebis(4-methyl-6-tert.butylphenol), 4,4'-butylidenebis(6-t-butyl-m-cresol), the reaction product of (a) dicyclopentadiene, (b) formaldehyde and (c) isobutylene and 2,2'-methylenebis-(6-nonyl-p-cresol).

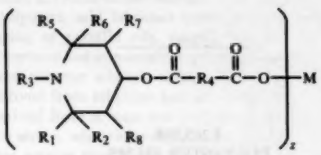
4,203,890

HINDERED PIPERIDINE CARBOXYLIC ACIDS, METAL SALTS THEREOF AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John L. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 671,910, Mar. 29, 1976, Pat. No. 4,101,509.
This application May 30, 1978, Ser. No. 910,553
The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.
Int. Cl.[2] C08K 5/34; C07D 211/46
U.S. Cl. 260—45.8 N 12 Claims

1. A compound of the formula



I

wherein

R_1 and R_2 independently of each other are straight- or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl, or alkyl substituted benzyl, or acyl,

R_4 is 1,2-cycloalkylene or 1,2-cycloalkenylene having 4 to 6 carbon atoms, 2,3-bicycloalkylene or 2,3-bicycloalkenylene having 7 to 8 carbon atoms or 1,2- 1,3- or 1,4-phenylene,

M is hydrogen or a metal selected from the group consisting of barium, calcium, magnesium, sodium, and potassium,

z has a value of from 1 to 4, the value of z being the same as the available valence of M, and either

(a) R_5 is alkyl of 2 to 6 carbon atoms, R_6 is alkyl of 1 to 6 carbon atoms, and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms, provided that R_7 and R_8 are not both hydrogen, or

(b) R_5 and R_6 together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a metyl group and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms.

4,203,891

METHOD OF COLLECTING ANTI-HEMOPHILIC FACTOR VIII FROM BLOOD AND BLOOD PLASMA USING HEPARIN OR SODIUM HEPARIN

Gail A. Rock, 270 Sandridge Rd., Ottawa, Ontario, Canada

Filed Dec. 29, 1977, Ser. No. 865,656
Claims priority, application Canada, Dec. 19, 1977, 293393
Int. Cl.[2] C07G 7/00
U.S. Cl. 260—112 B 7 Claims

1. A method for recovering antihemophilic Factor VIII from whole blood or blood plasma or blood plasma fractions which comprises collecting whole blood or blood plasma or blood plasma fractions from a donor directly into an anticoagulant agent selected from the group of heparin, sodium heparin, or mixtures thereof which agent does not reduce the physiological concentration of calcium in the whole blood or blood plasma or flood plasma fraction and recovering the desired antihemophilic Factor VIII.

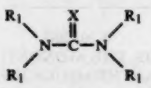
4,203,892

METHOD OF PROTECTING PROTEINS FOR ANIMAL FEED

Mendel Friedman, Moraga, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 17, 1978, Ser. No. 897,083
Int. Cl.[2] A23K 1/00; C08H 1/00
U.S. Cl. 260—112 R 7 Claims

1. A method for producing modified proteinaceous feed materials for ruminant animals, which comprises contacting a proteinaceous feed material with a compound of the structure-



wherein:

X is oxygen or sulfur

R_1 is independently hydrogen or lower alkyl containing 1–5 carbon atoms and containing at the alpha position hydroxyl, chlorine, bromine, iodine, alkoxyl, alkenoxyl, aryloxyl, substituted aryloxyl, and aryl-substituted alkoxyl and alkenoxyl, and wherein at least one R_1 is not hydrogen,

for a time and in an amount sufficient to chemically modify the proteinaceous material to protect it against microbial degradation in the rumen of the animal but render it capable of degradation and digestion in the intestines of the animal.

4,203,893

COUPLING PRODUCTS OF CYTIDINE-DIPHOSPHOCHOLINE AND AMINO-COMPOUNDS FOR PHARMACEUTICAL USE

Pierre Pery, Villepreux; Gerard Luffau; Joelle Poulain nee Charley, both of Plaisir, and Agnes Petit, Thiverval Grignon, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Aug. 30, 1978, Ser. No. 937,972
Claims priority, application France, Sep. 7, 1977, 77 27151
Int. Cl.[2] C08H 1/00; A61K 37/02
U.S. Cl. 260—121 7 Claims

1. Coupling products of cytidine-diphosphocholine and amino compounds selected from the group consisting of human albumin serum, ovalbumin, gelatin, lectins hemocyanine, limule, bacterial bodies, salmonellae flagellae, soya, lysine polymers having a degree of polymerization higher than 2, and synthetic polymers of amino acids possessing several lysine residues among compounds bearing free—NH_2 groups and compounds on which it is possible to fix lysine selected from the group consisting of polysaccharides and epichlorhydrin polymers, the coupling bond being formed after oxidation of the cytidine-diphosphocholine, under alkaline conditions between the oxidized ribose groups of the latter and the lysine residues of said amino compounds.

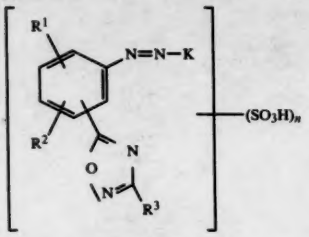
4,203,894

AZO DYES CONTAINING SULFONIC ACID GROUPS AND OXDIAZOLYL RADICALS

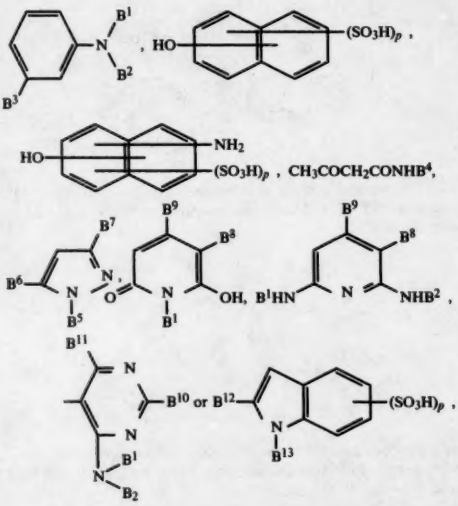
Walter Kurtz, Bad Durkheim, and Johannes Dehnert, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,753
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709660
Int. Cl.[2] C09B 29/02, 29/16, 29/30, 29/36
U.S. Cl. 260—156 10 Claims

1. An acid azo dye which in the form of the free acid has the formula



where
R^1 is hydrogen, chlorine or bromine,
R^2 is hydrogen, chlorine, bromine, nitro, methyl or trifluoromethyl,
R^3 is hydrogen; C_1 to C_8 alkyl; C_1 to C_8 alkyl substituted by hydroxy, C_1 to C_8 alkoxy or phenoxy; C_2 to C_8 alkyl interrupted by oxygen and substituted by hydroxy or phenyl; benzyl; phenylethyl; cyclohexyl; phenyl; phenyl substituted by chlorine, bromine, nitro, methyl, ethyl, methoxy, ethoxy, phenoxy or di-C_1 to C_4-alkylamino; naphthyl; pyridyl; thienyl; or furyl;
n is 1, 2 or 3 and
K is



where B^1 and B^2 independently of one another are hydrogen; C_1 to C_4 alkyl; C_2 to C_4 alkyl substituted by hydroxy, cyano, C_1 to C_4 alkoxy, C_1 to C_4 alkanoyloxy or C_1 to C_4 alkoxycarbonyl; C_3 to C_9 alkyl interrupted by oxygen and substituted by hydroxy or phenyl; cyclohexyl; benzyl; phenylethyl or phenyl;
B^3 is hydrogen, chlorine, methyl, C_1 to C_4 alkanoylamino or hydroxysulfonyl,
B^4 is phenyl or phenyl substituted by chlorine, bromine, methyl, ethyl, methoxy or ethoxy,
B^5 is hydrogen, C_1 to C_4 alkyl, cyclohexyl, benzyl, phenyl or phenyl substituted by chlorine, bromine, methyl or ethyl,
B^6 is hydroxy or amino,
B^7 is hydrogen, methyl, carbamoyl or C_1 to C_4 alkoxycarbonyl,
B^8 is cyano or carbamoyl,
B^9 is hydrogen, hydroxy or methyl,
B^{10} is B^1 or

B^{11} is B^1 or

B^{12} is methyl or phenyl,
B^{13} is hydrogen, methyl, β-cyanoethyl, β-hydroxyethyl, β-carboxyethyl or β-carbamoylethyl and
p is 0, 1 or 2 and the n hydroxysulfonyl groups are present in the radicals R^3 or K or in the ring bearing the substituents R^1 and R^2.

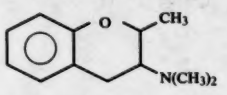
4,203,895

PROCESS FOR THE PREPARATION OF CIS-(±)-3,4-DIHYDRO-N,N,2-TRIMETHYL-2H-1-BENZOPYRAN-3-AMINE AND INTERMEDIATES PRODUCED THEREBY

Robert F. Parcell, Lakeland, Fla., and Ivan C. Nordin, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.Y.

Filed Apr. 14, 1978, Ser. No. 896,403
Int. Cl.[2] C07D *230/02, 311/04*
U.S. Cl. 260—239 E **66 Claims**

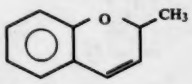
1. A process for preparing cis-(±)-3,4-dihydro-N,N,2-trimethyl-2H-1-benzopyran-3-amine having the formula I:



I

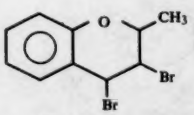
(cis)

which comprises the following steps:
1. reacting a solution of 2-methyl-2H-1-benzopyran having the formula II:



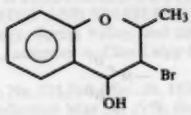
II

in water and a nonreactive, water-miscible solvent, with bromine to obtain, in situ, 3,4-dibromo-3,4-dihydro-2-methyl-2H-1-benzopyran having the formula IIa:

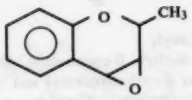


IIa

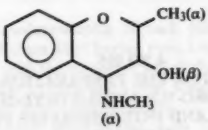
2. treating the reaction mixture of Step 1 with water and neutralizing with alkali to obtain 3,4-dihydro-3-bromo-2-methyl-2H-1-benzopyran-4-ol having the formula III:


III

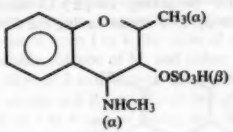
3. reacting compound III in water or a water miscible solvent with aqueous solution of methylamine to form, in situ, 3,4-epoxy-2-methylbenzopyran having the formula IIIa:


IIIa

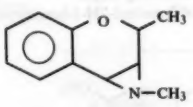
and continuing the reaction to form (2α,3β,4α)-(±)-3,4-dihydro-2-methyl-4-(methylamino)-2H-1-benzopyran-3-ol having the formula IV:


IV

4. reacting sulfuric acid in a hydrocarbon solvent or a halogenated hydrocarbon solvent with compound IV at a temperature above 110° C. to obtain (2α,3β,4α)-(±)-3,4-dihydro-2-methyl-4-(methylamino)-2H-1-benzopyran-3-ol, hydrogen sulfate ester having the formula V:

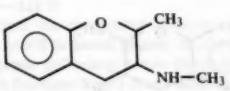

V

5. heating compound V and an alkali metal hydroxide to obtain (1aα,2β,7bα)-(±)-1,1a,2,7b-tetrahydro-1,2-dimethyl[1]benzopyrano[3,4-b]azirine having the formula VI:


VI

cis

6. subjecting a solvent solution of compound VI to catalytic hydrogenation to effect ring opening and formation of cis-(±)-3,4-dihydro-N,2-dimethyl-2H-1-benzopyran-3-amine having the formula VII:


VII

cis

7. methylating a solvent solution of compound VII at a temperature of from about 10° C. to about 150° C. for from about 20 minutes to about 48 hours to obtain compound I in the form of the free base or the non-toxic pharmaceutically acceptable salt thereof.

4,203,896

ACETOXY AZETIDIN-2-ONE ANTIBIOTICS VIA THIAZOLIDINE RING CLEAVAGE

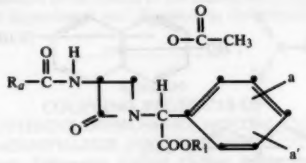
Gary A. Koppel, and Robin D. G. Cooper, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 855,841, Nov. 30, 1977, Pat. No. 4,144,232, which is a continuation-in-part of Ser. No. 753,980, Dec. 23, 1976, abandoned. This application Nov. 28, 1978, Ser. No. 964,401

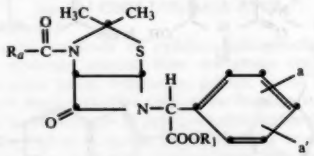
Int. Cl.[2] **C07D** *205/08*

U.S. Cl. 260—239 A **7 Claims**

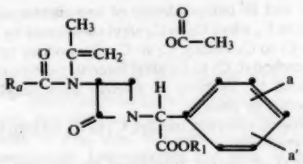
1. The process for preparing a trans-4-acetoxyazetidin-2-one compound of the formula



which comprises heating at a temperature between about 25° and about 75° C. a thiazolidine azetidinone compound of the formula



with mercuric acetate in the presence of acetic acid to form the N-propenyl trans-4-acetoxyazetidin-2-one amide of the formula



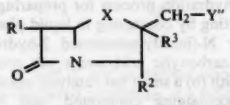
and hydrolyzing under acidic conditions said 4α-acetoxyazetidin-2-one amide, wherein R_a is C_1-C_3 alkyl, phenyl, benzyl, or phenoxymethyl; R_1 is hydrogen or a carboxylic acid protecting ester forming group; and a and a′ independently are hydrogen, halogen, hydroxy, protected hydroxy, C_1-C_4 alkyl, C_1-C_4 alkoxy, protected amino or protected aminomethyl.

4,203,897
PENAM DERIVATIVES

Takashi Kamiya, Suita; Tsutomu Teraji; Masashi Hashimoto, both of Toyonaka; Osamu Nakaguti, Nagaicho-higashi, and Teruo Oku, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

Division of Ser. No. 867,623, Jan. 6, 1978, which is a division of Ser. No. 648,491, Jan. 12, 1976, Pat. No. 4,084,049, which is a division of Ser. No. 407,962, Oct. 19, 1973, Pat. No. 3,954,732.
This application Apr. 23, 1979, Ser. No. 32,293
Claims priority, application Japan, Nov. 8, 1972, 47-112348; Dec. 12, 1972, 47-1201; Dec. 12, 1972, 47-128657; Dec. 20, 1972, 47-128659; Dec. 22, 1972, 47-2270; Aug. 1, 1973, 48-87108
Int. Cl.[2] C07D *499/44*
U.S. Cl. 260—239.1 4 Claims

1. A compound of the general formula:



wherein R^1 is a conventional, pharmaceutically acceptable acylamino, R^2 is carboxy or a conventionally protected carboxy, X is —S— or

R^3 is lower alkyl and Y″ is azido.

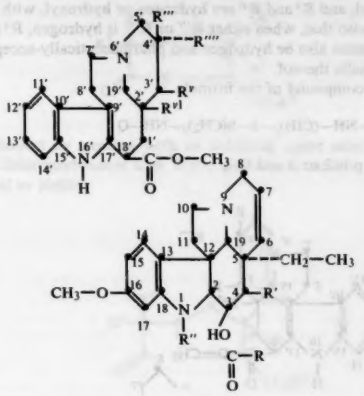
4,203,898
AMIDE DERIVATIVES OF VLB, LEUROSIDINE, LEUROCRISTINE AND RELATED DIMERIC ALKALOIDS

George J. Cullinan, Trafalger, and Koert Gerzon, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 828,693, Aug. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 721,650, Sep. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 539,681, Jan. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 446,869, Feb. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 347,275, Apr. 2, 1973, abandoned. This application Oct. 25, 1978, Ser. No. 954,514
Int. Cl.[2] C07D *519/04*
U.S. Cl. 260—244.4 23 Claims

1. A compound of the formula

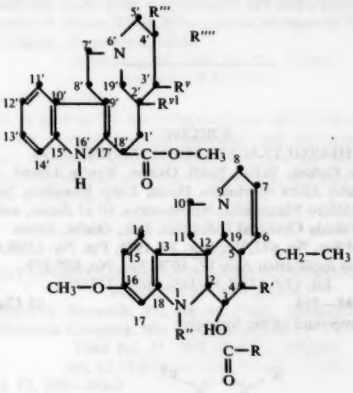
I



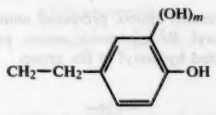
wherein R is NH_2, NH—NH_2, $N(CH_3)_2$, N_3, NH—CH_2—Y wherein Y is H, CN, CHO, $CH(O—C_1–C_3\text{-alkyl})_2$, NH—$C_2$—$C_6$-alkyl-X, NH—$C_2$–$C_6$-alkyl-$(OH)_{1-3}$, NH—$(CH_2)_n$—OAc, NH—$(CH_2)_n$—$OCH_3$, n is 2 or 3, X is SY′, NH_2, $NHCH_3$, $N(CH_3)_2$, NHAc, CN, H, phenyl, or COOH, Y′ is H, or C_1–C_3-alkyl and Ac is C_1–C_{17}-alkyl-CO or C_2–C_7-alkenyl-CO, pyrrolidinyl or NH—C_3–C_8-cycloalkyl; R′ is H, OH, O—$(C_1–C_3)$-alkanoyl or O-chloro-$(C_1–C_3)$-alkanoyl, R″ is hydrogen, methyl or formyl, one of R‴ and R⁗ is hydrogen or hydroxyl and the other is ethyl, and R^v and R^{vi} are hydrogen or hydroxyl, with the proviso that, when either R‴ or R⁗ is hydrogen, R^v and R^{vi} must also be hydrogen and pharmaceutically-acceptable salts thereof.

22. A compound of the formula

I



wherein
R is CH_2—CH═CH_2, CH_2—C≡CH, or



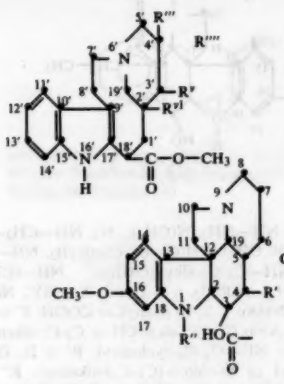
wherein m is 0 or 1;
R′ is H, OH, O—$(C_1–C_3)$-alkanoyl or O-chloro-$(C_1–C_3)$-alkanoyl, R″ is hydrogen, $(C_1–C_3)$-alkyl or formyl, one of

R''' and R'''' is hydrogen or hydroxyl and the other is ethyl, and R^v and R^{vi} are hydrogen or hydroxyl, with the proviso that, when either R''' or R'''' is hydrogen, R^v and R^{vi} must also be hydrogen and pharmaceutically-acceptable salts thereof.

23. A compound of the formula

$$Q—NH—(CH_2)_p—S—S(CH_2)_p—NH—Q$$

wherein p is 2 or 3 and Q is



I

wherein R' is H, OH, O—(C_1–C_3)-alkanoyl or O-chloro-(C_1–C_3)-alkanoyl, R'' is hydrogen, (C_1–C_3)-alkyl or formyl, one of R''' and R'''' is hydrogen or hydroxyl and the other is ethyl, and R^v and R^{vi} are hydrogen or hydroxyl, with the proviso that, when either R''' or R'''' is hydrogen, R^v and R^{vi} must also be hydrogen and pharmaceutically-acceptable salts thereof.

4,203,899

THIAZOLYLACETAMIDO COMPOUNDS

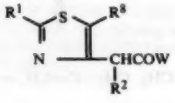
Michihiko Ochiai, Suita; Taiiti Okada, Kyoto; Osami Aki, Kawanishi; Akira Morimoto, Ikeda; Kenji Kawakita, Suita, and Yoshihiro Matsushita, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 642,356, Dec. 19, 1975, Pat. No. 4,098,888. This application Apr. 17, 1978, Ser. No. 897,239

Int. Cl.[2] **A61K** *31/545*; **C07D** *277/44*

U.S. Cl. 548—194 **12 Claims**

1. A compound of the formula:



wherein R^1 represents amino, protected amino, hydroxyl or protected hydroxyl, R^2 represents amino, protected amino, hydroxyl, protected hydroxyl or the group

represents a group of the formula

wherein R^5 is hydroxy or lower alkoxy, R^8 represents hydrogen or a halogen and W represents hydroxyl, C_{1-4} alkoxyl, halogen, or OM wherein M is an alkali metal.

4,203,900

PROCESS FOR PREPARING 2-OXAZOLINES

Mark E. Kaiser, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 3, 1977, Ser. No. 756,146

Int. Cl.[2] **C07D** *263/12, 263/14*

U.S. Cl. 548—239 **12 Claims**

1. A cyclodehydration process for preparing a 2-oxazoline comprising reacting by contacting in liquid phase (a) an N-(2-hydroxyalkyl)or N-(inertly-substituted 2-hydroxyalkyl) carboxamide or a carboxylic acid/amine salt precursor of said carboxamides with (b) a small but catalytic amount of a soluble inorganic iron-containing compound, said iron-containing compound not being an iron oxide.

4,203,901

PROCESS FOR MAKING N-(N'-METHYLENEPYRROLIDONYL)-2-SUBSTITUTED ANILINES

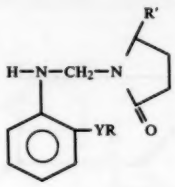
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 892,146, Mar. 31, 1978, Ser. No. 928,569, Jul. 29, 1978, Ser. No. 935,354, Aug. 21, 1978, Ser. No. 942,644, Sep. 15, 1978, and Ser. No. 955,483, Oct. 26, 1978. This application Nov. 20, 1978, Ser. No. 962,305

Int. Cl.[2] **C07D** *207/44*

U.S. Cl. 260—326.5 S **3 Claims**

1. A process for making intermediate compounds having the formula:



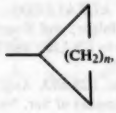
where

R is

alkyl, C_1–C_6,

alkenyl, C_3–C_5,

$—(CH_2)_n$, OR'' wherein n'=1–3, and R'' is alkyl, C_1–C_3,



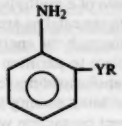
where n'=0–3,

R' is hydrogen or alkyl, C_1–C_3 and

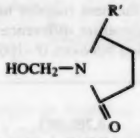
Y is oxygen or sulfur,

which comprises:

(a) heating a reaction mixture containing substantially equivalent molar amounts of a 2-substituted aniline having the formula:



and an N-hydroxy methylenepyrrolidone having the formula:



where R, R' and Y are as defined above, in a solvent, under non-catalyzed conditions, at a reflux temperature of about 80°–140° C.,

(b) simultaneously and continuously distilling out from the reaction mixture an azeotrope consisting essentially of water and solvent until substantially all the water produced during the reaction has been removed thereby, and thereafter,

(c) crystallizing the product from the remaining solution.

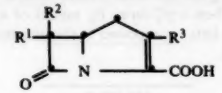
4,203,902

PROCESS FOR PREPARING 6- AND 2-SUBSTITUTED-1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

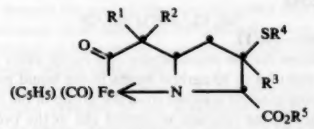
David H. Shih, Edison, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 21, 1978, Ser. No. 898,591
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—326.31 2 Claims

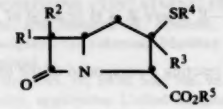
1. A process for preparing:



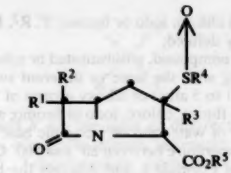
wherein R^1 and R^2 are independently selected from hydrogen, alkyl and hydroxyl-substituted alkyl having 1 to 6 carbon atoms, benzyl, and phenyl; R^3 is hydrogen, —R, —OR, and —SR wherein R is hydrogen and substituted and unsubstituted: alkyl having 1–6 carbon atoms, phenyl, and benzyl wherein the substituent is amino; consisting of treating:



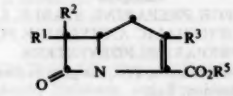
with an oxidizing agent selected from Ag_2O, CuO, PbO_2, or Cl_2 to yield:



followed by treating with an oxidizing agent selected from m-chloroperbenzoic acid, H_2O_2, perbenzoic acid or peracetic acid to yield:



which is treated with base selected from triethylamine, piperidine, pyridine, or diisopropylamine to yield:



wherein: R^4 is phenyl and R^5 is hydrogen or benzyl; when R^5 is benzyl, the benzyl group is removed by hydrogenolysis to yield the free acid.

4,203,903

PROCESS FOR THE RECOVERY OF SPECTINOMYCIN

Timothy W. Evans, Three Rivers, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 10, 1979, Ser. No. 37,492
Int. Cl.[2] C07D *319/08*
U.S. Cl. 260—340.3 12 Claims

11. A process for removing inorganic salts from an aqueous concentrate containing spectinomycin and said inorganic salts which comprises adding benzoic acid or a salt thereof, and a water-miscible solvent to said concentrate adjusted to a pH of about 5 to about 9.

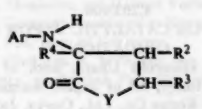
4,203,904

ALKYLATION OF ANILINE WITH A LACTONE IN THE PRESENCE OF A BASE

Richard N. Reynolds, Jr., Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 27, 1978, Ser. No. 928,481
Int. Cl.[2] C07D *307/32, 207/26, 333/36*
U.S. Cl. 260—343.6 9 Claims

1. A process for making a compound of the formula



I

wherein

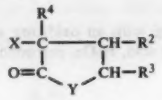
Ar is phenyl or phenyl substituted with the same or different substituents selected from 1 to 5 alkyl or alkoxy groups of 1 to 4 carbon atoms; 1 to 2 fluoro, chloro, iodo or bromo; and 1 nitro;

R^2, R^3 and R^4 are hydrogen or alkyl of 1 to 4 carbon atoms; and

Y is O, S or N—R where R is H or alkyl of 1 to 4 carbon atoms,

which comprises:

contacting and reacting a compound of the formula



wherein X is chloro, iodo or bromo; Y, R^2, R^3 and R^4 are as previously defined;

with an aniline compound, unsubstituted or substituted in the aromatic ring with the same or different substituents selected from 1 to 5 alkyl or alkoxy groups of 1 to 4 carbon atoms; 1 to 2 fluoro, chloro, iodo or bromo; and 1 nitro, in the presence of water and an inorganic base in a reaction zone at a temperature between 80° and 160° C. to form the compound of Formula I, and wherein the base is added sufficiently slowly to the reaction zone so that the pH does not exceed about 7.5.

4,203,905

METHOD FOR PREPARING STABLE, LIQUID TETRAHYDROPHTHALIC ANHYDRIDE FOR USE IN PREPARING POLYESTERS

Marvin Z. Woskow, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 541,315, Jan. 15, 1975, abandoned. This application Aug. 17, 1978, Ser. No. 934,505

Int. Cl.[2] **C07D** *307/24*

U.S. Cl. 260—346.3 **6 Claims**

1. A method for preparing tetrahydrophthalic anhydride for use in preparing polyesters and characterized as a stable, liquid form for transportation and storage having viscosity of less than 10 poise at a temperature of 50° C. comprising the steps of:

(a) heating a glycol having 2 to 9 carbon atoms to a temperature in the range of 100° to 120° C.,

(b) adding molten cis-Δ^4-tetrahydrophthalic anhydride to said glycol at a rate which does not cause the temperature of the mixture to rise in increments of more than 5° F. said temperature being maintained below 155° C., said anhydride being added to a final mole ratio of glycol to anhydride in the range of about 0.8 to 1.2:1,

(c) reacting said mixture under an inert gas blanket at a temperature in the range of 120° to 170° C. for a sufficient period of time to reduce the acid number of said mixture to a number in the range below the theoretical acid number for the half ester of said glycol and said anhydride, to not less than 165,

(d) cooling said reaction mixture to a temperature less than 155° C.,

(e) adding said glycol to said cooled reaction mixture to a mole ratio of glycol to anhydride in the range of 1.2 to 2:1, and

(f) cooling said mixture of glycol and reaction mixture to a temperature in the range of 40° to 70° C.

4,203,906

PROCESS FOR CATALYTIC VAPOR PHASE OXIDATION

Masahiro Takada; Hiroyuki Uhara, both of Tatsuno, and Takahisa Sato, Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 7, 1978, Ser. No. 922,791

Claims priority, application Japan, Jul. 13, 1977, 52-83036; Jul. 14, 1977, 52-83609; Jul. 20, 1977, 52-86010

Int. Cl.[2] **C07D** *307/89*

U.S. Cl. 260—346.4 **13 Claims**

1. A process for catalytic vapor phase oxidation which comprises using a fixed-bed shell and tube heat exchange type reactor in which a bundle of a multiplicity of tubes filled with at least one type of oxidizing catalyst are disposed in a shell and these tubes are passed through the apertures formed in at least one perforated shield plate to partition the inside of the shell into at least two heat transfer medium feed zones and in such a manner that each of the tubes passing through the perforated shield plate is not in direct contaction with the shield plate but the outer surface of the tube and the inner surface of the aperture are spaced apart by a distance of between 0.2–5 mm, supplying feed gas to the tubes of the reactor, and conducting exothermic catalytic vapor phase oxidation while controlling the temperatures for the heat transfer medium in each of the zones so that the temperature difference between each of the zones can be maintained between 0°–100° C.

4,203,907

PROCESS FOR PREPARING A FURANIC COMPOUND

Richard C. Cookson, Southampton, England; Karl-Heinrich Schulte-Elte, Onex, and Arnold Hauser, Petit-Lancy, both of Switzerland, assignors to Firmenich, S.A., Geneva, Switzerland

Filed Jun. 27, 1978, Ser. No. 919,484

Claims priority, application Switzerland, Jun. 28, 1977, 7902/77

Int. Cl.[2] **C07D** *307/38*

U.S. Cl. 260—346.11 **7 Claims**

1. A process for the preparation of 3-methyl-2-[3-methyl-but-2-en-1-yl]-furan which comprises the following subsequent steps:

(a) adding a 2-methyl-prop-2-en-1-yl magnesium halide to furfural to yield 2-[1-hydroxy-3-methyl-but-3-en-1-yl]-furan;

(b) reacting the thus obtained carbinol with an alkyl ortho-acetate in the presence of a catalyst selected from the group consisting of carboxylic acids or an organic protonic acid having a pK_a of about 7 to 9 to give an alkyl 2-[3-methyl-but-3-en-1-ylidene]-2,3-dihydro-furyl-acetate;

(c) treating said ester with an acidic agent to given an alkyl 2-[3-methyl-but-2-en-1-yl]-furyl-acetate, and

(d) hydrolyzing and then decarboxylating the obtained alkyl furyl-acetate;

or

(c') hydrolyzing and then decarboxylating the alkyl 2-[3-methyl-but-3-en-1-ylidene]-2,3-dihydro-furyl acetate obtained in accordance with letter (b) above and

(d') isomerizing the terminal double bond of 3-methyl-2-[3-methyl-but-3-en-1-yl]-furan by means of a thermal treatment of this latter compound in the presence of palladium on charcoal.

4,203,908

MANUFACTURE OF CYCLIC ETHERS

Herbert Mueller, Frankenthal, and Otto H. Huchler, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 942,654

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743345

Int. Cl.[2] **C07D** *307/08*

U.S. Cl. 260—346.11 **4 Claims**

1. A process for the manufacture of a cyclic ether by dehydrating a diol of 4 to 10 carbon atoms in the liquid phase over a dehydrating catalyst selected from the group of the bleaching earths, wherein the reaction is carried out in the presence of from 0.3 to 1.8 percent by weight, based on the amount of bleaching earth used, of an alkali metal or alkaline earth metal carbonate or bicarbonate.

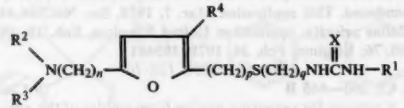
4,203,909

FURAN COMPOUNDS

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 26, 1978, Ser. No. 945,968
Int. Cl.[2] C07D *307/54*
U.S. Cl. 260—347.2 15 Claims

1. A compound of the formula



wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive; R^2 and R^3 are the same or different and are hydrogen, (lower)alkyl, (lower-)alkenyl, (lower)alkynyl or Ar; R^4 is hydrogen or (lower)alkyl; n is an integer of from 1 to 6; p is 1 or 2 and q is 2 or 3, provided that the sum of p and q is 3 or 4; X is NR^5 or CHR^5; R^5 is cyano, nitro, SO_2Ar or SO_2(lower)alkyl; and Ar is phenyl or phenyl containing one or two substituents independently selected from (lower)alkyl and halogen, or a nontoxic, pharmaceutically acceptable salt thereof.

4,203,910

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert M. Gipson, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Continuation of Ser. No. 814,520, Jul. 11, 1977, abandoned. This application Feb. 7, 1979, Ser. No. 10,184
Int. Cl.[2] C07D *301/20*
U.S. Cl. 260—348.29 2 Claims

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° C. to about 200° C. and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and nitrogen.

4,203,911

PROCESS FOR CONJUGATING UNCONJUGATED UNSATURATION OF FATTY ACIDS OR ESTERS THEREOF

Daniel A. Scarpiello, Parma Heights, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,560
Int. Cl.[2] C09F *7/08*; C11C *3/14*
U.S. Cl. 260—405.6 6 Claims

1. In a process for conjugating unconjugated unsaturation in polyunsaturated lipid feedstock by contacting said feedstock with a sulfided nickel catalyst in an agitated reaction zone, the improvement which comprises:

establishing and maintaining in said reaction zone a positive hydrogen pressure of not substantially above about 10 psig, a catalyst concentration of about 0.2 to 3% nickel by weight, and a temperature of between about 200° and 250° C. until substantially maximum conjugation of said feedstock occurs.

4,203,912

COMPOSITIONS CONTAINING PLATINUM

Paul C. Hydes, and Bernard W. Malerbi, both of Reading, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Oct. 18, 1978, Ser. No. 952,607
Claims priority, application United Kingdom, Oct. 19, 1977, 43493/77; May 18, 1978, 20460/78
Int. Cl.[2] C07F *15/00*
U.S. Cl. 260—429 R 3 Claims

1. A cis co-ordination compound of platinum having the structure

in which X and Y are the same or different ligands selected from sulphate, phosphate, nitrate, tartronate, benzylmalonate, cyclobutane-1, 1-dicarboxylate, phthalate, oxalate, tartrate, pyruvate, gluconate, succinato, glutarato, adipato, pimelato and malato and water and A and B are the same or different alicyclic amines selected from cyclopentamine and cyclohexylamine co-ordinated to the Pt through their N atoms, such that the platinum is present as Pt^{2+}.

4,203,913

STABILIZATION OF ORGANOPOLYSILOXANES

Jurgen Burkhardt, Halsbach, and Karl-Heinrich Wegehaupt, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 17, 1976, Ser. No. 687,064
Claims priority, application Fed. Rep. of Germany, May 30, 1975, 2524041
Int. Cl.[2] C07F *7/04*
U.S. Cl. 556—401 14 Claims

1. A method for stabilizing the viscosity of organopolysiloxanes prepared in the presence of phosphoronitrile chlorides, which comprises treating the organopolysiloxane with a basic nitrogen compound selected from the class consisting of ammonia, an amine of the general formula

$$YHNC(CH_3)_n(CH_2X)_{3-n}$$

and mixtures thereof in which X is selected from the class consisting of a radical of the formulae $—OCH_3$, $—N(CH_3)_2$, $—C(CH_3)_3$, $—C(CH_3)_2NHY$ and $—OC(CH_3)_3$ and a hydrogen atom, Y is selected from the class consisting of hydrogen and a trimethylsilyl radical, and n represents 0, 1, 2, or 3, in which the amount of basic nitrogen compound is from 1 to 5 moles per mole of phosphoronitrile chloride calculated as $PNCl_2$ used in the preparation of the organopolysiloxane.

4,203,914

SILYL ESTERS OF PERFLUOROALKANESULPHONIC ACID ESTERS AND A PROCESS FOR THEIR PREPARATION

Ulrich Finke, Ettlingen; Hans-Heinrich Moretto, Cologne; Hans Niederprüm, Monheim, and Helmut Vorbrüggen, Berlin, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 2,112
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803125
Int. Cl.[2] C07F *7/08*
U.S. Cl. 556—428 4 Claims

3. A perfluoroalkanesulphonic acid trialkylsilyl ester of the formula

$$C_nF_{2n+1}SO_3SiR^1R^2R^3$$

wherein

R^1, R^2, and R^3 have the abovementioned meaning and each independently is alkyl with 1 to 6 carbon atoms,

n is from 1 to 12, and

the total number of carbon atoms in Cn, R^1, R^2 and R^3 is at least 6.

4,203,915
PROCESS OF PRODUCING METHANOL

Emil Supp, Dietzenbach; Heinz Jockel, Klein-Gerau; Hagen Krumm, Frankfurt am Main, and Friedemann Marschner, Oberursel, all of Fed. Rep. of Germany, assignors to Metallgesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 850,565, Nov. 11, 1977, abandoned, which is a continuation of Ser. No. 724,031, Sep. 17, 1976, abandoned. This application Sep. 25, 1978, Ser. No. 945,727

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603204

Int. Cl.[2] **C07C** *31/04, 31/06*

U.S. Cl. 260—449.5 **3 Claims**

1. In the production of methanol from gaseous and liquid hydrocarbons having a higher C/H ratio than is stoichiometrically required to produce methanol, wherein said hydrocarbons are catalytically cracked in the presence of water vapor and at a temperature of about 350°–950° C. and under a pressure of about 5–30 bars to produce a synthesis gas containing hydrogen and oxides of carbon, followed by a catalytic reaction of the hydrogen with the oxides of carbon at a temperature of about 230°–280° C. and under a pressure of about 30–150 bars to produce methanol, the improvement which comprises treating the methanol synthesis exhaust gas adiabatically in an adsorption unit filled with aluminosilicate molecular sieve so as to remove therefrom the carbonaceous gaseous constituents so that the residual gas is pure hydrogen, adding said hydrogen to the hydrocarbons prior to cracking in an amount such that the C/H ratio of the material to be cracked is up to about 5.7, and burning the carbonaceous gaseous constituents removed from the methanol synthesis exhaust gas by the molecular sieve as fuel for heating of the cracking catalyst thereby reducing the energy consumption per unit of methanol produced.

4,203,916
PREPARATION OF TRANS CYCLOHEXANE 1,4 DIISOCYANATE

Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 6, 1978, Ser. No. 883,949

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2710595

Int. Cl.[2] **C07C** *103/19, 118/00, 125/06, 127/15*

U.S. Cl. 260—453 P **10 Claims**

1. A process for making a trans-cyclohexane-1, 4 diisocyanate preferentially to its cis-stereisomer which comprises

(a) reacting mixed cis- and trans-cyclohexane-1,4-dicarboxylic acid or an ester thereof with ammonia in a liquid polyhydric alcohol solvent for the acid or ester at a temperature of from about 25° C. to about 200° C. and under an ammonia partial pressure of about 0.1 bar to about 50 bars;

(b) separating the resulting solid dicarboxylic acid diamide from the liquid phase including any water soluble constituents therein,

(c) suspending the resulting semi-solid diamide in an aqueous mineral acid or water,

(d) chlorinating the resulting suspended diamide to form cyclohexane-1,4 dicarboxylic acid-bis-N-chloramide,

(e) reacting said chloramide with a primary or secondary amine in an aqueous reaction mixture containing an alkaline metal hydroxide or alkaline earth metal hydroxide to form a trans-cyclohexane-1,4 diurea, and

(f) reacting said diurea with gaseous hydrogen chloride in an inert solvent for the diurea to form trans-cyclohexane-1,4 diisocyanate.

4,203,917
CATALYTIC PROCESS FOR PREPARING NITRILES FROM AMIDES

Bernard M. Delmon, Wavre; Michel C. Portenart, Drogenbos, and Heinz Viehe, Beersel, all of Belgium, assignors to Unibra Societe Anonyme, Brussels, Belgium

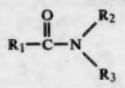
Continuation-in-part of Ser. No. 769,826, Feb. 17, 1977, abandoned. This application Mar. 7, 1978, Ser. No. 884,443

Claims priority, application United Kingdom, Feb. 19, 1976, 06595/76; Belgium, Feb. 24, 1978, 185451

Int. Cl.[2] **C07C** *120/10*

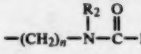
U.S. Cl. 260—465 B **9 Claims**

1. A process for preparing nitriles from amides of the general formula



(I)

in which R_1 represents hydrogen or a lower alkyl radical, R_2 represents hydrogen, a lower alkyl radical having a straight or branched chain, allyl, propargyl, an aryl radical selected from mono- and polynuclear aromatic hydrocarbon groups, wherein said aryl radical can optionally be substituted by one or more substituent groups selected from lower alkyl radicals, halogen atoms, OH and SH groups, a carboxyl group, trifluoro- or trichloromethyl groups, a cyano group and an NH_2 group, or an aralkyl radical in which the alkyl moiety is a lower alkylene group and in which the aryl moiety is selected from mono- and polynuclear aromatic hydrocarbon groups, wherein said aryl moiety of said aralkyl radical can be optionally substituted by one or more substituent groups selected from lower alkyl radicals, halogen atoms, OH and SH groups, a carboxyl group, trifluoro- or trichloromethyl groups, a cyano group and a NH_2 group, and R_3 represents hydrogen, a lower alkyl radical having a straight or branched chain, allyl, propargyl, an aryl radical selected from mono- and polynuclear aromatic hydrocarbon groups, wherein said aryl radical can optionally be substituted by one or more substituent groups selected from lower alkyl radicals, halogen atoms, OH and SH groups, a carboxyl group, trifluoro- or trichloromethyl groups, a cyano group and an NH_2 group, an aralkyl radical in which the alkyl moiety is a lower alkylene group and in which the aryl moiety is selected from mono- and polynuclear aromatic hydrocarbon groups, wherein said aryl moiety can optionally be substituted by one or more substituent groups selected from lower alkyl radicals, halogen atoms, OH and SH groups, a carboxy group, trifluoro- or trichloromethyl groups, a cyano group and an NH_2 group, or a radical of the formula



wherein n is equal to 1 to 6, and R_1 and R_2 have the above meanings, with the proviso that at least one of the symbols R_1, R_2 and R_3 is different from hydrogen, said process comprising reacting an amide of formula I in gaseous phase at a temperature between 400° and 650° C. on a catalyst selected from the group consisting of

(i) bismuth molybdate, bismuth phosphomolybdate, antimony molybdate, bismuth tungstate,

(ii) manganese, cobalt, iron (III), tellurium and cerium molybdate.

(iii) Bi_2O_3—MoO_3; MoO_3—Sb_2O_3; Sb_2O_3—SnO_2; CuO—Al_2O_3; and UO_x—Sb_2O_3 ($2<x<3$); and

(iv) mixtures of any proportions of two or more of these compounds.

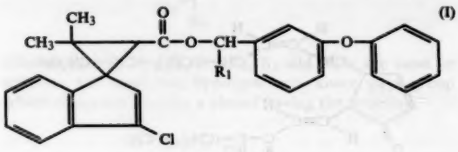
4,203,918

HALO-SUBSTITUTED BENZOSPIRO CYCLOPROPANE CARBOXYLATES AS INSECTICIDES AND IXODICIDES

Dale G. Brown, Hopewell, N.J., assignor to American Cyanamid Company, Stamford, Conn.

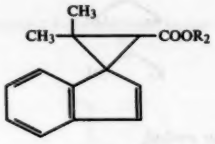
Filed Jul. 21, 1978, Ser. No. 926,990
Int. Cl.[2] C07C *120/00, 67/00;* A01N *9/20*
U.S. Cl. 260—465 D 1 Claim

1. A method for preparing compounds of the formula:



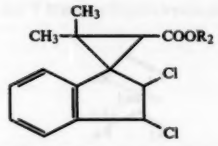
(I)

wherein R_1 is hydrogen or cyano which comprises
reacting a spirocyclopropanecarboxylic acid ester of the formula



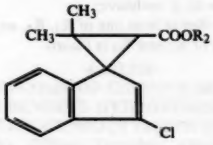
II

wherein R_2 is C_1–C_3 alkyl with a halogenating agent in the presence of an inert solvent at a temperature in the range of from 20° C. to 30° C. for a period of time to essentially complete the reaction and obtain the dihalo derivative of the formula



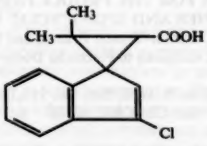
III

dehydrohalogenating the dihalo derivative III under anhydrous conditions with an alkali metal alkoxide in the presence of a solvent to produce the ester



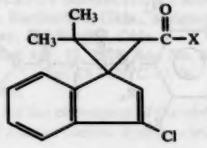
IV

hydrolizing the ester IV with a base in a dilute alcohol to yield the acid



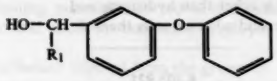
V

converting the acid V to the acid halide



VI

wherein X is halogen by reacting acid V with a thionyl halide in the presence of an inert solvent
isolating the acid halide VI and then
reacting the acid halide VI with a benzyl alcohol



VII

in the presence of an acid acceptor and an inert solvent to yield the compound of formula I.

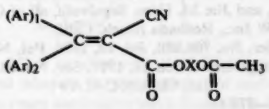
4,203,919

(ACETOXYALKYL) 2-CYANO-3,3-DIPHENYLACRYLATE INTERMEDIATES FOR MAKING COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER COMPOUNDS

Bruce A. Gruber, Bloomingdale, and Donald H. Lorenz, Basking Ridge, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 3, 1979, Ser. No. 35,648
Int. Cl.[2] C07C *121/70*
U.S. Cl. 260—465 D 6 Claims

1. (Acetoxyalkyl) 2-cyano-3,3-diphenylacrylate intermediate compounds having the formula:



where $(Ar)_1$ and $(Ar)_2$ are aromatic carbocyclic nuclei of the benzene and naphthalene series and are independently selected from phenyl or phenyl substituted with alkyl, halo, alkoxy, carboxy, carbalkoxy, cyano, acetyl, benzoyl, phenyl, alkyl phenyl, phenoxy phenyl, alkyl substituted phenoxy, or alkoxy phenyl substituted phenyl, and naphthyl; and,
X is alkylene, C_2-C_{17}, unsubstituted or substituted with halo, cyano, alkyl, C_1-C_6, alkoxy, C_1-C_6 alkoxyalkyl, C_1-C_6, or alkoxyalkyleneoxy, C_1-C_6.

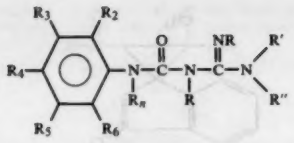
4,203,920

AMIDINOUREAS

Julius Diamond, Morris Plains, N.J., and George H. Douglas, Paoli, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 787,673, Apr. 14, 1977, abandoned, which is a division of Ser. No. 558,187, Mar. 31, 1975, Pat. No. 4,060,635. This application Jul. 21, 1978, Ser. No. 926,675
Int. Cl.[2] C07C *127/19*
U.S. Cl. 260—553 A 12 Claims

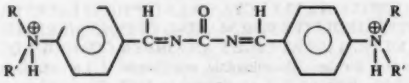
1. A compound of the formula:



where:
R_2 is hydrogen or loweralkyl;
R_3, R_4 and R_5 are hydroxy or loweralkoxy;
R_6 is hydrogen, loweralkyl, nitro, loweralkoxy or halo;
R and R_n are hydrogen or loweralkyl; and
R′ and R″ are hydrogen or alkyl, provided at least one of R, R′ and R″ is other than hydrogen; and
the non-toxic acid addition salts thereof.

4,203,921
STABILIZED REAGENTS
Ram B. Roy, Spring Valley, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Oct. 30, 1978, Ser. No. 956,007
Int. Cl.[2] C07C *127/00*
U.S. Cl. 260—553 A **2 Claims**

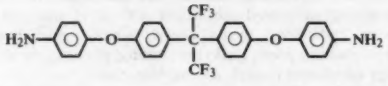
1. A protonated reagent of the general formula:



where R and R′ are the same or different and each selected from a group consisting of: H and a lower alkyl.

4,203,922
FLUORINATED AROMATIC DIAMINE
Robert J. Jones, Hermosa Beach; Michael K. O'Rell, Manhattan Beach, and Jim M. Hom, Sepulveda, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Division of Ser. No. 706,880, Jul. 19, 1976, Pat. No. 4,111,906. This application Oct. 11, 1977, Ser. No. 841,085
Int. Cl.[2] C07C *93/14*
U.S. Cl. 260—570 R **1 Claim**

1. An aromatic diamine compound having the structure;

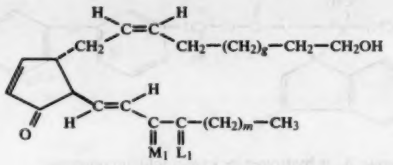


4,203,923
METHOD FOR PROMOTION OF PHENOL HYDROGENATION
Chuen Y. Yeh, Succasunna, and Harry E. Ulmer, Morris Township, Morris County, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.
Continuation-in-part of Ser. No. 527,467, Nov. 26, 1974, abandoned. This application Mar. 17, 1976, Ser. No. 667,760
Int. Cl.[2] C07C *41/00, 46/15*
U.S. Cl. 568—362 **10 Claims**

1. In a process for producing cyclohexanone by the hydrogenation of phenol in the presence of a nonpromoted palladium catalyst, the improvement which comprises adding to the hydrogenation reaction mixture a promoter selected from the group consisting of ammonia, ammonium hydroxide, secondary amines and mixtures thereof.

4,203,924
2-DECARBOXY-2-HYDROXYMETHYL-DEOXY-9,10-DIDEHYDRO-PGD$_2$ ANALOGS
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 647,369, Jan. 28, 1976, Pat. No. 4,032,576. This application Apr. 6, 1977, Ser. No. 784,981
Int. Cl.[2] C07C *49/56*
U.S. Cl. 568—379 **15 Claims**

1. A prostaglandin analog of the formula



wherein M_1 is

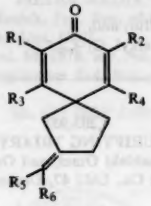
wherein
R_5 is hydrogen or methyl;
wherein L_1 is

or a mixture of

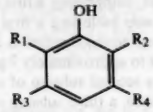
wherein R_3 and R_4 are hydrogen, methyl or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is one, 2, or 3; and
wherein m is one to 5, inclusive;
with the proviso that at least one of R_3, R_4, and R_5 is methyl or at least one of R_3 and R_4 is fluoro.

4,203,925
PROCESS FOR THE PRODUCTION OF SPIRODIENONES AND SPIROCYCLIC KETONES
Derek H. R. Barton, Gif-sur-Yvette, France, and Brian J. Willis, Bergenfield, N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.
Filed Jun. 9, 1978, Ser. No. 914,160
Int. Cl.[2] C07C *45/00*
U.S. Cl. 568—362 **9 Claims**

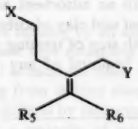
1. A process for preparing a spirodienone compound having the structure:



wherein each of R_1, R_2, R_3, R_4, R_5 and R_6 is the same or different and represents hydrogen or a lower alkyl group which comprises reacting a phenol having the structure:



and a 2-alkylidene-1,4-disubstituted butane having the structure:



wherein X and Y are selected from the group consisting of halogens and sulfonate groups of the structure —O—SO_2—R where R may be an aliphatic or aromatic hydrocarbon moiety, or wherein X and Y together form a cyclic sulfate group of the structure

in the presence of a base and at a temperature in the range from about −70° to +220° C. to form said spirodienone compound.

4,203,926

HYDROXIDATION OF GASEOUS OLEFINS WITH ETHYLBENZENE HYDROPEROXIDE IN A HETEROGENEOUS LIQUID SYSTEM

Ching-Yong Wu, O'Hara Township, Allegheny County, and Thaddeus P. Kobylinski, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 18, 1978, Ser. No. 970,103

Int. Cl.[2] C07C *27/16, 29/02, 31/16, 49/78*

U.S. Cl. 568—319 **13 Claims**

1. A method of concurrently preparing a glycol, acetophenone and 1-phenylethanol which comprises contacting ethylbenzene hydroperoxide with ethylene or propylene at an elevated pressure in a heterogeneous, two-phase liquid reaction system comprising ethylbenzene, an organic polar solvent, a catalytic quantity of osmium tetroxide and an aqueous solution of cesium hydroxide, rubidium hydroxide or potassium hydroxide at a moderate temperature.

4,203,927

OLEFIN OXIDATION PROCESS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 11, 1978, Ser. No. 895,339

Int. Cl.[2] C07C *45/04*

U.S. Cl. 568—401 **16 Claims**

1. A process for the conversion of the olefinic carbon-carbon double bond of a mono-olefinic hydrocarbon reactant comprising contacting:

(a) at least one olefin with

(b) oxygen in

(c) a reaction diluent comprising at least two liquid phases wherein at least one liquid phase is an aqueous phase, and in the presence of

(d) a catalyst comprising palladium, copper, and a boron-containing material that provides a catalytically active boric acid under the conditions employed in the reaction, and

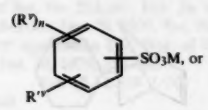
(e) a surfactant selected from the group of:

(1) quaternary ammonium salts of the general formula $(R'''')_4N^+X^-$,

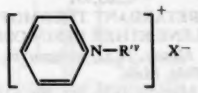
(2) alkali metal alkyl sulfates of the general formula $R'^{\nu}O\text{-}SO_3M$,

(3) alkali metal salts of alkanoic acids of the general formula $R'^{\nu}CO_2M$,

(4) alkali metal salts of alkaryl sulfonic acids of the general formula



(5) 1-alkyl pyridinium salts of the general formula



wherein R'''' is an alkyl radical of from 1 to 20 carbon atoms and wherein the total number of carbon atoms in said quaternary ammonium salt is from about 8 to about 30 carbon atoms; X^- is selected from the group consisting of Br^-, Cl^-, I^-, F^-, $R''''CO_2^-$, QSO_3^-, BF_4^-, HSO_4^- wherein Q is an aryl or alkaryl radical of 6 to 10 carbon atoms; R'^{ν} is an alkyl radical of from 10 to about 20 carbon atoms; M is an alkali metal; R^{ν} is an alkyl radical of 1 to 4 carbon atoms and wherein n is 0 or an integer of from 1 to 4,

under such oxidation conditions sufficient to oxidize the olefinic carbon-carbon double bond of (a) to a carbonyl group.

4,203,928

PROCESS FOR THE PREPARATION OF 2-NITROBENZALDEHYDE

Horst Meyer, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 11, 1975, Ser. No. 557,296

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1974, 2415062

Int. Cl.[2] C07C *45/18*

U.S. Cl. 568—424 **9 Claims**

1. The process for the preparation of 2-nitrobenzaldehyde which comprises treating an alkali metal salt of the corresponding 2-nitrophenylpyruvic acid with an alkali metal hypochlorite in an aqueous medium to yield the corresponding 2-nitrobenzylidene chloride and subjecting said 2-nitrobenzyli-

dene chloride to aqueous hydrolysis at a temperature of from about 20° to about 150° C.

4,203,929

GEM DICHLOROCYCLOPROPANES AND METHOD OF MAKING SAME

Sobhy Tawfik, 89-15 102nd St., Richmond Hill, N.Y. 11418

Filed Jun. 16, 1978, Ser. No. 915,920
Int. Cl.[2] C07C *17/28*
U.S. Cl. 260—648 D **1 Claim**

1. The method of making gem dichlorocyclopropane comprising reacting 2,3-dimethyl-2-butene with chloroform in liquid phase by phase transfer catalysis in the presence of cetyl trimethyl ammonium bromide in a sodium hydroxide solution at a temperature of −7° to 40° C.

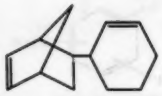
4,203,930

CODIMER OF NORBORNADIENE AND CYCLOHEXADIENE

Harry K. Myers, Jr., Aston, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 818,489, Jul. 25, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,231
Int. Cl.[2] C07C *13/32*
U.S. Cl. 585—22 **2 Claims**

1. Codimer of norbornadiene and 1,3-cyclohexadiene having the following structure:



4,203,931

FLAME RETARDANT THERMOPLASTIC POLYPHENYLENE ETHER RESIN COMPOSITIONS

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 29, 1976, Ser. No. 671,342
Int. Cl.[2] C08K *5/15*; C08L *71/04*
U.S. Cl. 525—4 **10 Claims**

1. A self-extinguishing, non-dripping thermoplastic molding composition possessing a combination of improved mechanical properties and good flame resistance characteristics which comprises:
(i) a polyphenylene ether resin;
(ii) a styrene resin;
(iii) a halogenated aromatic frame retardant compound;
(iv) an antimony containing compound; and
(v) an additive selected from the group consisting of polyesters and, polyethylene.

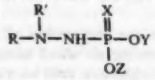
4,203,932

PHOSPHORYL HYDRAZINES

Michael J. Brown, Randolph, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,132
Int. Cl.[2] A01N *9/36*; C07F *9/24, 9/22*
U.S. Cl. 260—923 **2 Claims**

1. Compounds having the formula:



where
R is carbalkoxyalkyl, C_2–C_6 and
R′ is hydrogen;
X is oxygen or sulfur; and,
Y and Z are both alkyl, C_1–C_6.

4,203,933

METHOD OF PURIFYING TRIARYL PHOSPHATE

Sadayoshi Mukai; Yoshiaki Otani, and Osamu Yamaguchi, all c/o Nissin Electric Co., Ltd., 47, Umezu Takase-cho, Ukyo-ku, Kyoto, Japan

Filed May 9, 1978, Ser. No. 904,261
Claims priority, application Japan, May 20, 1977, 52-59229
Int. Cl.[2] C07F *9/09*
U.S. Cl. 260—990 **26 Claims**

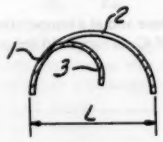
1. A method of purifying a triaryl phosphate to be used as electrical insulating oil, comprising: a first step of washing said phosphate, said first step including a first substep of washing said phosphate with an aqueous solution containing from approximately 1 percent to approximately 7 percent by weight of an alkali compound, a second substep of separating said solution from said phosphate, a third substep of rinsing said phosphate with water, and a fourth substep of separating said water from said phosphate; a second step of diluting said phosphate with an amount of an aromatic insulating oil effective to reduce the viscosity of said phosphate; a third step of treating said diluted phosphate with an adsorbent acid clay in an atmosphere of dry gas so that said clay adsorbs the impurities in said phosphate; and a fourth step of treating said phosphate under reduced pressure for removal of any remaining impurities therefrom.

4,203,934

TOWER PACKING ELEMENT

Max Leva, 2160 Greentree Rd., Pittsburgh, Pa. 15220

Continuation-in-part of Ser. No. 749,272, Dec. 10, 1976, abandoned, which is a continuation of Ser. No. 586,529, Jun. 13, 1975, abandoned. This application Mar. 17, 1978, Ser. No. 887,604
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—98 **12 Claims**



1. In a packing for a vapor- or gas-liquid contact tower and the like, a plurality of randomly packed, mutually interlocking packing elements providing a bed having substantial physical stability, each packing element comprising an open-ended curved strip exhibiting curvature only in a single direction and the curvature extending through an angular range of about 90 to 180 degrees, said strip having a plurality of tongues selected ones of which are different lengths and extending only inwardly of the curvature of said strip, at least one slot extending along said single direction in said curved strip, the surface of said strip and tongues being otherwise smooth and free of small perforations, at least one of said tongues extending for at least a distance equal to about one-fifth the distance from its base at the concave surface of said strip to the center between the ends of said strip, so as to permit interlocking with and prevent nesting with adjacent packing elements and provide a homogeneous packing.

4,203,935

FILTER MEDIA

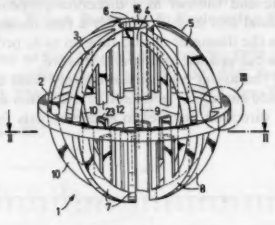
Ernst Hackenjos, Munich, Fed. Rep. of Germany, assignor to Rolf Jaeger, Costa Mesa, Calif.

Filed Jul. 10, 1978, Ser. No. 923,003

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739236

Int. Cl.[2] B01F 3/04

U.S. Cl. 261—98 18 Claims



1. A filter body adapted for use in a scrubber of the type including a tower within which are disposed a plurality of the filter bodies which thereby define a bed, the scrubber operating by passing a liquid downwardly through the bed while passing a gas upwardly through the bed, said filter body comprising:

a latticework jacket defined by an annular meridian ring, a plurality of arcuate bars extending upwardly and downwardly from said annular meridian ring, and a plurality of fingers extending from at least some of said arcuate bars towards a plane defined by said annular meridian ring and wherein at least a majority of said arcuate bars have a cross-sectional shape tapering inwardly towards said annular meridian ring.

4,203,936

WATER SLURRY PROCESS FOR MANUFACTURING PHENOLIC RESIN BONDED FRICTION MATERIALS

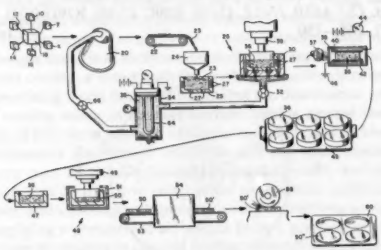
Robert S. Kiwak, Northville, and Tung Liu, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 754,477, Dec. 27, 1976, abandoned.

This application Jul. 12, 1978, Ser. No. 923,883

Int. Cl.[2] B29G 1/00; H05B 9/00

U.S. Cl. 264—26 9 Claims



1. A dustless process for producing organic friction articles comprising the steps of:

mixing together dry ingredients including a thermosetting phenolic resin containing from 7–15% by weight of hexamethylenetetramine, asbestos and friction modifiers to form a composition of material;

adding a solution of water and from 4–24% by weight of hexamethylenetetramine to said composition of material to form a slurry;

communicating a fixed volume of said slurry into a first mold;

compressing said slurry in said first mold to remove up to 95% by weight of said solution to form a briquette;

drying said briquette through dielectric heating to heat the briquette from the inside to the outside and remove up to 99% by weight of the water in said solution from the briquette to reestablish substantially the same weight relationship of ingredients therein as in said composition of material; and

curing the dried briquette in a second mold to a desired shape and density.

4,203,937

PROCESS AND APPARATUS FOR THE MANUFACTURE OF PREFABRICATED LINED WALL SECTIONS

Hans Lingl, Neu-Ulm-Ludwigsfeld, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

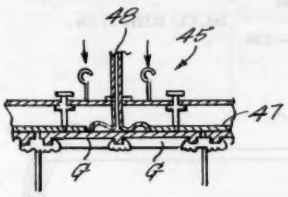
Continuation of Ser. No. 552,261, Feb. 24, 1975, abandoned.

This application Jan. 26, 1977, Ser. No. 762,921

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408484; Jan. 30, 1975, 2503685

Int. Cl.[2] B32B 3/10

U.S. Cl. 264—101 10 Claims



1. A method of producing a preformed finished wall section comprising the steps of:

(a) disposing a preformed wall panel of bricks, blocks, or the like, in a generally horizontal plane, said panel being adapted to be disposed vertically when a finished wall section of which the panel is a part is in use,

(b) arranging in a generally horizontal plane a plurality of individual tile members or the like in substantially abutting engagement with each other to form an unconnected lining panel,

(c) applying a plurality of columns of mortar on the upper surface of said wall panel, said columns being arranged in generally parallel relationship,

(d) automatically introducing spaces of predetermined uniform dimension between said tile members by moving said tile members out of substantially abutting engagement with each other for proper disposition thereof in relationship with said wall panel,

(e) transferring said unconnected lining panel members in groups into operative position above said wall panel, and

(f) pressing said lining panel tile members in groups onto said wall panel, said individual members being connected to each other and said wall panel by said columns of mortar, thereby forming a preformed finished wall section.

4,203,938

MANUFACTURE OF POLYTETRAFLUOROETHYLENE TUBES

Edward L. Burnett, and Eugene V. Stack, both of Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 500,801, Aug. 26, 1974, abandoned. This application Jul. 6, 1976, Ser. No. 703,048

Int. Cl.[2] B27J *5/00*

U.S. Cl. 264—127 **2 Claims**

1. In a method for the preparation of a polytetrafluoroethylene tube from a polytetrafluoroethylene in a finely divided form suitable for molding, a mandrel of generally constant cross-sectional configuration is provided, polytetrafluoroethylene in finely divided form is disposed about at least a portion of the mandrel, the polytetrafluoroethylene is subsequently pressed against the mandrel with sufficient force to result in a compacted generally coherent compacted tubular polytetrafluoroethylene preform and the preform subsequently removed from the mandrel,

the improvement which comprises compacting the polytetrafluoroethylene at a temperature below about the crystalline transition of the polytetrafluoroethylene at about 19° C., raising the temperature of at least the tubular preform to a temperature above the crystalline transition of the polytetrafluoroethylene at about 19° C. and removing the mandrel from the tubular preform.

4,203,939

PROCESS AND APPARATUS FOR TREATMENT OF THE EXIT SURFACE OF SPINNERETS

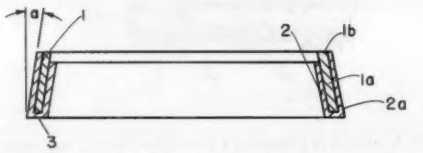
Werner Drachenberg, Heinsberg, and Heinrich Wolters, Waldfeucht, Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 24, 1978, Ser. No. 890,000

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713601

Int. Cl.[2] B29H *21/04*

U.S. Cl. 264—130 **14 Claims**



1. A process for treating the exit face of spinnerets having a plurality of orifices with a finishing oil selected from creeping oils, which are thermally stable at temperature of at least about 300° C., for the spinning of fibers from a melt, comprising applying the finishing oil uniformly only to a peripheral zone on the face of said spinneret located between the outer edge and the spinneret orifices nearest said outer edge by means of an absorbent, surfactant material in contact with the spinneret face at said peripheral zone.

4,203,940

CRYSTAL WAFER RACK STRUCTURES AND THE METHOD OF PRODUCING THE SAME

Wolfgang Dietze, and Gerhard Bachmann, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 27, 1974, Ser. No. 510,071

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1973, 2349512

Int. Cl.[2] B28B *1/48*

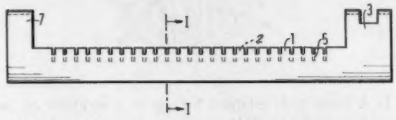
U.S. Cl. 264—154 **3 Claims**

1. A method of manufacturing rack structures composed of a silicon material selected from the group consisting of Si and SiC for supporting crystal wafers during diffusion and annealing operations, comprising:

forming, in a manner known per se, a tube having a diameter which is smaller than the diameter of the crystal wafer to be supported by the rack structures by depositing said silicon material from a gas phase thereof onto a heated graphite carrier member and removing the carrier member without destroying the so-formed tube;

machining the so-formed tube on a relatively narrow transverse portion of a side surface of said tube adjacent to at least one end thereof in a direction perpendicular to a longitudinal axis of said tube for a first distance which is less than the diameter of said tube so as to produce a tube having a cut at least at one end thereof;

machining the so-cut tube on a relatively wide axial portion of said side surface of said tube at a location adjacent said cut in a direction parallel to said tube axis for a vertical



distance substantially equal to said first distance so as to produce two spaced apart wall portions having free edges extending parallel to said tube axis and being joined to one another by at least one bridging portion located at least at said one end of the tube to define an initial rack structure;

machining the so-formed initial rack structure along said spaced apart wall portions at spaced intervals along the free edges thereof in a direction perpendicular to said tube axis for a second distance which is less than the height of said wall portions so as to produce a plurality of uniformly spaced support grooves in each of said wall portions for transversely supporting crystal wafers therein; and

machining the so-formed initial rack structure surface opposite said spaced apart wall portion thereof along the entire length of such structure in a direction parallel to said tube axis for a third distance which is less than said second distance so as to produce two spaced apart independent wall edges capable of standing on a flat support means.

4,203,941

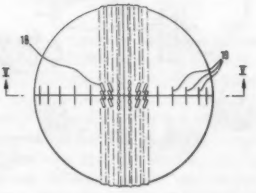
BALL AND METHOD FOR MAKING IT

Bernard F. Brooker, Silver Birches, Balcombe Rd., Crawley, Sussex, England

Filed Dec. 27, 1978, Ser. No. 973,596

Int. Cl.[2] A63B *37/12, 45/00*; B29C *27/00*; B29D *9/00*

U.S. Cl. 264—250 **7 Claims**



1. In a method for making a ball having a core and a cover molded over the core, the improvement comprising the steps of providing a preformed spherical core, assembling a supporting shell from a plurality of preformed shell elements so as to enclose said core in said supporting shell, the shell elements having a plurality of spaced projections extending substantially radially therefrom, the projections having tips which define an

imaginary sphere substantially concentric with said spherical core, supporting the core and shell in a spherical mold by means of said projections and molding a covering material about over the core and shell.

4,203,942

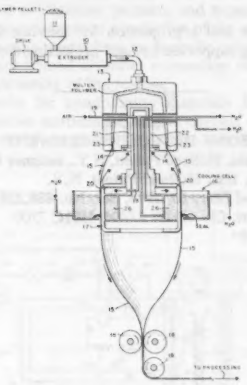
PROCESS FOR TUBULAR WATER-BATH POLYPROPYLENE FILMS

J. Robert Sims, Jr., Waquoit, Mass.; Willard N. Mitchell, Baytown, and Charles W. Williamson, Seabrook, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 492,091, Jul. 26, 1974, abandoned, which is a continuation of Ser. No. 322,034, Jan. 8, 1973, abandoned. This application Dec. 9, 1977, Ser. No. 859,000

Int. Cl.[2] B29D *23/04*

U.S. Cl. 264—559 **4 Claims**



1. In a process for the formation of tubular polypropylene film having a width of 60 to 80 inches and a thickness between 1 and 2.5 mils comprising extruding polypropylene resin having a shear stress between 18.0 and 22.0 and a die swell between 2.2 and 3.6, generally downwardly through a die with an annular orifice in the form of a molten substantially tubular film body, maintaining the pressure in said substantially tubular film body at a constant figure of about 0.1 to 1.0 inch of water, preliminarily cooling the internal surface of said tubular film body with a directed stream of gaseous material to partially solidify said film, subsequently downwardly passing said film to engage in sequence a cooling mandrel comprising an air slot at the point of film entry over said mandrel, said mandrel having a texturized surface next to the film and being internally water cooled, a water bath for cooling the exterior of said film comprising a cell designed to control the distribution and flow of cooling water in counter-current fashion against the direction of film flow, said cell having a resilient seal at its lower end to maintain water level within the cell and to minimize water carry over by the film passing through the cell, and an overflow weir at the flow entry point to maintain outflow water level, and utilizing multiple step airing comprising a means for supplying a pressurized air stream from a primary orifice, said stream expanding in control fashion through sucessively larger multiple orifices, thereby guiding and controlling the expansion of the film between the die and mandrel, said successive orifices being independently adjustable in axial position relative to the primary orifice, whereby a plurality of annular pressure zones are arranged externally to said tubular film body in the region between said die and said mandrel, said pressure zones being highest near said die and lowest near said mandrel, to define an expansion gradient for said film between said die and said mandrel and thereafter recovering said tubular film, at through-put rates of about 500 to 540 lbs./hr., the improvement comprising attaining through-put rates of about 700 lbs./hr. by:

(a) effecting controlled, shaped pre-expansion of molten polypropylene from said annular orifice by providing a gradual taper of said orifice to a gap of about 0.025 inch, which is maintained for about 1 inch and subsequently flared at a 2° to 5° angle within said die at the last 0.5 inch of said orifice just prior to extrusion;

(b) effecting said preliminary cooling with a high velocity jet of air at a rate of approximately 100 to 250 scm from an annular slot in said cooling mandrel, the angle of said slot from the horizontal being about 25° to 45° and the width of said slot being from about 50 to 100 mils; and

(c) effecting further cooling along the internal surface of the film with water supplied to the exterior of said cooling mandrel at a point above the level of said water bath for cooling the exterior of the film, said water for cooling the internal surface additionally forming a liquid boundary between the interior of the film and the mandrel.

4,203,943

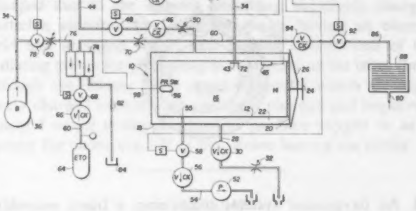
METHOD OF BIOCIDAL STERILIZATION USING CYCLIC SUBATMOSPHERIC PRESSURE CONDITIONING

John R. Gillis, Harborcreek, and Frank E. Halleck, Erie, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Nov. 11, 1977, Ser. No. 850,846

Int. Cl.[2] A61L *5/00, 1/00, 3/00*

U.S. Cl. 422—27 **9 Claims**



1. Method for conditioning goods for sterilization and sterilizing such goods with ethylene oxide in a sealable chamber capable of operating below atmospheric pressure within prescribed leak rate limits,

such conditioning being carried out prior to introduction of the ethylene oxide and independent of load contact measurement requirements of temperature in the goods, the conditioning including heating the goods, moistening the goods, and removal of air from the goods to facilitate heating and moistening of the goods to be sterilized, the method comprising the steps of

loading the goods to be sterilized into the chamber and sealing the chamber,

preselecting upper and lower subatmospheric pressure levels for controlled cyclic pulsing operation of such chamber during load conditioning,

evacuating the chamber and injecting a condensable vapor having transferrable latent heat and moisture into the chamber to condition the goods to be sterilized by cyclically varying chamber pressure between such upper and lower subatmospheric pressure levels independent of prescribed evacuating and vapor injecting times such that the time duration of a pressure rise from lower to higher preselected subatmospheric pressure levels during a cyclic variation is directly responsive to characteristics of the

goods being conditioned including moisture and heat absorption characteristics of such goods,

such subatmospheric pressure levels being selected based on an interrelationship of pressure and temperature of the condensable vapor with such upper pressure level establishing an upper temperature for injecting the condensable vapor which approximates without exceeding the desired final sterilization temperature for the goods to be sterilized,

the evacuating of such chamber and the injecting of the condensable vapor into such chamber being carried out non-simultaneously and alternately to bring about such cyclic variations in chamber pressure,

repeating such cyclic variation of chamber pressure between the preselected subatmospheric pressure levels to provide a plurality of cyclic pulses during such load conditioning before termination of evacuation of the sealable chamber in preparation for ethylene oxide gas sterilization, and

after such termination of evacuation of the sealable chamber, introducing ethylene oxide gas into such chamber to accomplish the desired sterilization of goods in the chamber.

4,203,944

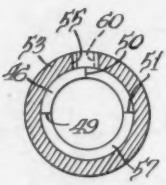
RESPIRATORY GAS ASSEMBLY FOR BUBBLE OXYGENATOR

Richard A. DeWall, 247 Northview Rd., Dayton, Ohio 45419

Continuation of Ser. No. 739,554, Nov. 8, 1976, which is a division of Ser. No. 411,332, Oct. 31, 1973, Pat. No. 3,994,689, which is a continuation-in-part of Ser. No. 178,647, Sep. 8, 1971, abandoned. This application Jul. 13, 1978, Ser. No. 924,379

Int. Cl.[2] A61M *1/03*

U.S. Cl. 422—47 **19 Claims**



1. An oxygenator system, comprising: a frame assembly, means for supplying venous blood to the frame assembly, a respiratory gas and blood mixing chamber, means for supplying oxygen to said chamber, and selectively operable means for preventing the flow of blood from the mixing chamber into the means for supplying oxygen to the chamber, said means for supplying oxygen to said mixing chamber including a first tube in the mixing chamber, a second tube in the mixing chamber surrounding said first tube, first aperture means in said first tube and second aperture means in said second tube selectively communicable to vent the oxygen supplying means and block oxygen or blood flow relative to said mixing chamber through said tubes.

4,203,945

BUBBLE OXYGENATOR

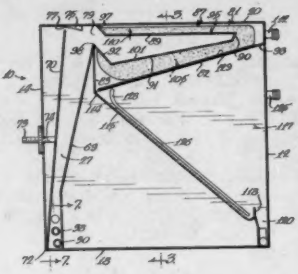
Richard A. De Wall, 247 Northview Rd., Dayton, Ohio 45419

Continuation of Ser. No. 739,553, Nov. 8, 1976, which is a division of Ser. No. 411,332, Oct. 31, 1973, Pat. No. 3,994,689, which is a continuation of Ser. No. 178,647, Sep. 8, 1971, abandoned. This application Jul. 13, 1978, Ser. No. 924,352

Int. Cl.[2] A61M *1/03*

U.S. Cl. 422—47 **4 Claims**

1. A bubble oxygenator, comprising: housing means, a bubble chamber in said housing means for oxygenating blood, means for supplying venous blood to the bubble chamber, means for supplying respiratory gas to the bubble chamber, and means for varying the flow capacity of the bubble chamber including control means for varying the size of the chamber during use, the control means including a movable wall pivotally mounted in the housing means to define one side of the bubble chamber and a projection for moving the wall, the projection being supported by, and projecting from, the housing means.



4,203,946

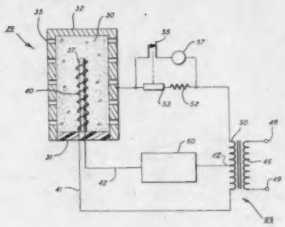
OZONE DETECTING ELEMENT

Joseph L. Ryerson, Holland Patent, N.Y., assignor to Energy for Independence, Inc., Holland Patent, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,228

Int. Cl.[2] G01N *27/04*; H01C *7/00*

U.S. Cl. 422—98 **12 Claims**



1. A sensing element for detecting the presence of ozone at ambient temperatures and pressures including

a porous body section containing a lower valence oxide of a variable valence semiconductor material that is capable of being oxidized in the presence of ozone to a higher valence oxide at ambient temperatures and pressures, and

at least two electrodes mounted in spaced apart contact with the body section whereby an electrical current may be passed therethrough.

4,203,947

LOAD CONDITIONING CONTROL APPARATUS FOR STEAM STERILIZATION

Jack H. Young, Cambridge Springs, and Frank E. Halleck, Erie, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 850,845, Nov. 11, 1977, Pat. No. 4,164,538. This application Feb. 2, 1979, Ser. No. 8,925

Int. Cl.[2] A61L *5/00, 1/00, 3/00*

U.S. Cl. 422—114 **6 Claims**

1. Apparatus for conditioning materials forming a load within a sealable sterilizing chamber capable of operation at pressure above atmospheric for steam sterilization without requiring selection of quantity or characteristics of the materials, such conditioning including removal of air, moistening the load, and heating of the load to a desired temperature in preparation for sterilization, the apparatus comprising:

evacuation means operable to evacuate the sterilizing chamber,

vapor injection means operable to inject a vapor having a transferrable latent heat into the sterilizing chamber,

and control means controlling operation of the evacuation means and the vapor injection means to provide cyclic pulsing of chamber pressure to provide a plurality of cyclic pulses of chamber pressure below an upper pressure level related to desired temperature for sterilization,

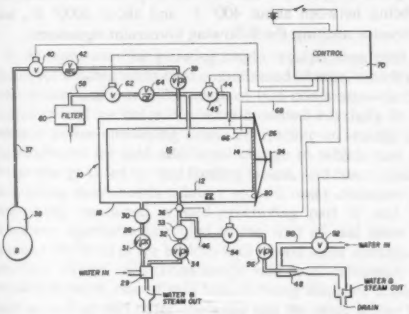
each cyclic pulse including an evacuating phase during which pressure in the chamber is decreasing during operation of the evacuation means and a vapor injecting phase during which pressure within the chamber is increasing during operation of the vapor injecting means,

pressure sensing means monitoring chamber pressure change during cyclic pulsing,

timing means for measuring the time of the evacuation phase of the cyclic pulses, and

such control means including means responsive to such indication of chamber pressure and evacuation time for determining the rate of evacuation of the chamber and for automatically controlling such cyclic pulsing in response to the determined chamber evacuation rate to complete the conditioning of the load.

2. Apparatus for conditioning materials forming a load within a sealable sterilizing chamber capable of operation at pressure above atmospheric for steam sterilization without



requiring selection of quantity or characteristics of the materials, such conditioning including removal of air and heating of the load to a desired temperature for sterilization, the apparatus comprising:

evacuation means operable to evacuate the sterilizing chamber,

steam injection means operable to inject steam into the sterilizing chamber,

means operating the evacuation means and the steam injection means to provide cyclic pulsing of chamber pressure including a plurality of cyclic pulses of chamber pressure below an upper pressure level related to desired temperature for sterilization,

each cyclic pulse including an evacuating phase during which pressure in the chamber is decreasing during operation of the evacuation means and a steam injecting phase during which pressure within the chamber is increasing during operation of the steam injecting means,

pressure sensing means monitoring chamber pressure change during a cyclic pulse,

timing means for measuring the time of each evacuation phase, and

pulse cycle control means for controlling such cyclic pulsing responsive to such indication of chamber pressure and evacuation time,

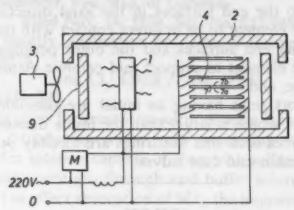
such control of cyclic pulsing including control of the means operating the evacuation means to continue each evacuation phase of the cyclic pulse until both a predetermined time has lapsed and a predetermined vacuum level is reached in the sterilizing chamber and control of the steam injecting means during cyclic pulsing to heat the load to the desired sterilization temperature and to remove air from throughout the sterilizing chamber irrespective of load size and load characteristics.

4,203,948

AIR PURIFIER OF THE REGENERATING TYPE

Niels Brundbjerg, Resedavej 12, DK-2820 Gentofte, Denmark

Filed Jul. 26, 1978, Ser. No. 928,160
Claims priority, application Denmark, Aug. 4, 1977, 3499/77
Int. Cl.[2] B03C *3/43, 3/82*
U.S. Cl. 422—121 **3 Claims**



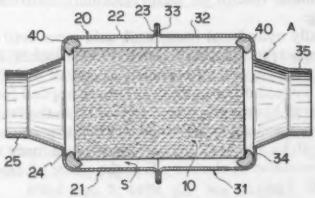
1. An air purifier comprising a housing constructed of a negative charge absorbing non-conductive material, said housing having an air inlet and an air outlet; means for flowing an air stream through said housing from said inlet to said outlet; radiating means in said housing for emitting electrons and X-rays having a wavelength of at least 165 nm and producing in the stream ozone molecules which become positively charged due to the housing absorbing negatively charged particles; electron-cloud forming means having an electric field and arranged within said housing downstream of the radiating means for generating in the stream, as the latter flows through the electric field, ozone molecules which are negatively charged whereby the positively charged and negatively charged ozone molecules react to produce oxygen so as to reduce the ozone content of the stream leaving the outlet.

4,203,949

CATALYST CONVERTER FOR CLEANING EXHAUSTS OF CARS

Yoshio Mase; Tadayoshi Hayashi, both of Niiza; Shinichi Natsuume, Higashi-Kurume; Yasuhisa Kobayashi, Wako, and Yoshiyuki Moriya, Kami-Fukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 789,012, Apr. 20, 1977, abandoned.
This application Aug. 28, 1978, Ser. No. 937,511
Claims priority, application Japan, Apr. 23, 1976, 51-51013
Int. Cl.[2] B01J *35/04;* F01N *3/15*
U.S. Cl. 422—179 **8 Claims**



1. A catalyst converter for cleaning the exhaust of a vehicle, comprising:

a case;

said case being divided at its substantially central portion thereof in the axial direction to form two case halves;

a catalyst-carrying ceramic element provided with honeycomb passages;

support rings formed entirely of compressed metallic fibers including netted steel wires;

each said support ring having an L-shaped cross-section;

support portions on said case halves, said support portions and said support rings applying an axial compression of 15 to 75 KG/cm^2 to said catalyst-carrying ceramic element;

said compressed metallic fiber support rings directly contacting both said ceramic element and said support portions, and holding said ceramic element between said rings while imparting compression to said ceramic element in radial and axial directions;

said compressed metallic fiber support rings being directly fitted to the end surfaces in the axial direction of said ceramic element to be in direct contact with the radially-extending end surfaces and the outer periphery of said ceramic element to support said ceramic element within said case; and

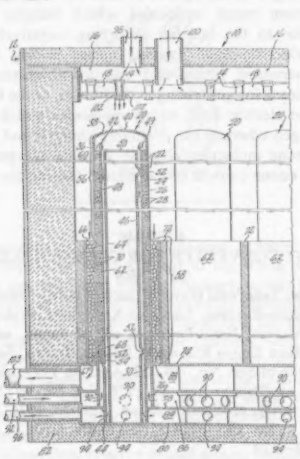
said support rings having an initial pre-assembled outside diameter which is larger than the inside diameter of said case halves such that said rings are forcibly pressed and fitted within said case halves.

4,203,950

STEAM REFORMING REACTOR DESIGNED TO REDUCE CATALYST CRUSHING

Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1977, Ser. No. 864,511
Int. Cl.[2] B01J *7/00, 8/06*
U.S. Cl. 422—197 **1 Claim**



1. An annular reactor for steam reforming hydrocarbon fuel comprising:

a generally cylindrical inner wall, said inner wall having a thickness t_1 in the range of 0.02 to 0.25 inches, said inner wall being capable of a limited degree of yielding in the radial inward direction in response to applied forces, said inner wall having an outer diameter D_1 in the range of 1 to 11 inches and a coefficient of thermal expansion α in the range of 5×10^{-6} to $12\times10^{-6}°F.^{-1}$, said inner wall having a modulus of elasticity E in the range of 27×10^{-6} to 32×10^{-6} psi;

an intermediate wall, said intermediate wall being coextensive in length with said inner wall and being coaxial therewith to define a first annular chamber, said intermediate wall having a thickness t_2 in the range of 0.1 to 1.0 inches and an inner diameter D_2 in the range of 2 to 12 inches, the coefficient of thermal expansion and modulus of elasticity of said intermediate wall being chosen to be the same as those of said inner wall, said intermediate wall always being thicker than said inner wall;

catalyst particles disposed in said first annular chamber between said inner and intermediate walls, said catalyst particles having a coefficient of thermal expansion α_c in the range of 3×10^{-6} to $8\times10^{-6}°F.^{-1}$;

a generally cylindrical outer wall, said outer wall being coaxial with said inner and intermediate walls to define a second annular chamber between a portion of said intermediate and outer walls, said outer wall having a thickness t_3 in the range of 0.02 to 0.25 inches, the thickness of the outer wall always being less than the thickness of the intermediate wall, said outer wall having an inner diameter D_3 in the range of 4 to 16 inches, said outer wall being chosen to have a coefficient of thermal expansion and a modulus of elasticity commensurate with those of the inner and intermediate walls;

a particulate heat exchange material disposed in said second annular chamber between said outer and intermediate walls, said heat transfer material being pervious to fluid flow and having a coefficient of thermal expansion α_p in the range of 3×10^{-6} to $8\times10^{-6}°F.^{-1}$, said inner wall, intermediate wall, catalyst particles, outer wall and heat transfer material respectively being subjected to thermal cycles ΔT_2, ΔT_1, ΔT_c, ΔT_3 and ΔT_p, said thermal cycles being between about 400° F. and about 2000° F., said reactor meeting the following constraint equations:

$$P_c\alpha = \frac{\left[\dfrac{D_2^2\Delta T_2 - D_1^2\Delta T_1}{D_2^2 - D_1^2}\right] - \alpha_c\Delta T_c}{\dfrac{1}{2E}\left[\dfrac{\dfrac{D_2^3}{t_2} + \dfrac{D_1^3}{t_1}}{D_2^2 - D_1^2}\right] + \dfrac{2}{3B}}$$

and

$$P_p\alpha = \frac{\left[\dfrac{D_3^2\Delta T_3 - D_2^2\Delta T_2}{D_3^2 - D_2^2}\right] - \alpha_p\Delta T_p}{\dfrac{1}{2E}\left[\dfrac{\dfrac{D_3^3}{t_3} + \dfrac{D_2^3}{t_2}}{D_3^2 - D_2^2}\right] + \dfrac{2}{3B'}}$$

where the mechanical pressure P_c on the solid particle bed after cooling of the walls defining the first annular chamber and the mechanical pressure P_p on the heat transfer material after cooling of the walls defining the second annular chamber do not exceed 7500 psi and wherein B is the bulk modulus of the catalyst particles and B' is the bulk modulus of the heat transfer material; and

means delivering a gaseous fuel to the base of said first annular chamber for flow upwardly through said catalyst particles.

4,203,951
APPARATUS FOR GROWING SINGLE CRYSTALS FROM MELT WITH ADDITIONAL FEEDING OF COMMINUTED CHARGE

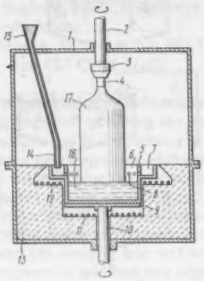
Valentin I. Goriletsky, ulitsa Otokara Yarosha, 17, kv. 53; Oleg S. Mjulendorf, ulitsa Geroev Truda, 47b, kv. 242; Alexei V. Radkevich, ulitsa Zernovaya, 53, kv. 56, and Lev G. Eidelman, ulitsa Otokara Yarosha, 17, kv. 53, all of Kharkov, U.S.S.R.

Filed Nov. 23, 1977, Ser. No. 854,237

Claims priority, application U.S.S.R., Nov. 23, 1976, 2421865[I]

Int. Cl.[2] B01J *17/18*

U.S. Cl. 422—249 2 Claims



1. An apparatus for growing single crystals from melt with means for feeding additional comminuted charge, which apparatus comprises a crucible made of two containers—an inner container and an outer container-mounted coaxially in each other to define containing means comprising an annular space therebetween for said additional charge to which said additional charge is fed by said feeding means, said inner container protruding downwards relative to said outer container, said melt being contained in said protruding part of said inner container; apertures provided in the wall of said inner container at the level of the bottom wall of said outer container for overflow of said melt therefrom to said inner container; independent heaters, one of said heaters being disposed under the bottom wall of said outer container and the other heater being located under the bottom wall of said inner container.

4,203,952
PROCESS FOR THE REMOVAL OF HEAVY METALS AND TRANSITION METALS OTHER THAN PLATINUM FROM SOLUTION

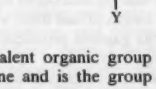
Ronald D. Hancock, Weybridge, and Ian V. Howell, Woking, both of England, assignors to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 575,739, May 8, 1975, abandoned. This application Sep. 8, 1977, Ser. No. 831,603

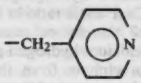
Int. Cl.[2] B01D *15/00, 15/02*

U.S. Cl. 423—6 21 Claims

1. A process for purifying liquids containing mercury, silver, lead, copper, cadmium, rhodium or uranium metal residue which comprises removing such a metal by contacting a liquid solution containing such a metal in the form of a soluble compound thereof with a substrate obtained by reacting an inorganic solid contacting surface hydroxyl groups with a compound of the formula



wherein R is a divalent organic group of up to 20 carbon atoms; Y is the same and is the group $—OR_3$ where R_3 is hydrogen or an alkyl group; or Y is chlorine; and X is —SH, $—NHCH_2CH_2NH_2$, $—NH_2$, or



4,203,953
PROCESS FOR REMOVING SO_2 FROM WASTE GASES

Hartmut Simoleit, and Ludwig Walter, both of Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 14, 1974, Ser. No. 523,745

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1973, 2356976

Int. Cl.[2] C01B *17/00, 17/02*

U.S. Cl. 423—243 14 Claims

1. In a process for removing sulfur dioxide from waste gases including introducing waste gases containing sulfur dioxide into a buffer solution capable of absorbing sulfur dioxide, and passing said waste gas through said buffer solution at a controlled pH to effect absorption of SO_2, the improvement which comprises using a buffer solution containing glycerol in a amount between about 20% to about 70% of the solution for sulfur dioxide absorption from the waste gases.

4,203,954
PROCESS FOR DESULFURIZATION OF EXHAUST GASES RECOVERING GYPSUM AS BY-PRODUCT

Etsuo Asanagi, Kashiwa, Japan, assignor to Chiyoda Chemical Engineering & Construction Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1978, Ser. No. 893,446

Claims priority, application Japan, Apr. 5, 1977, 52-38106

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—243 7 Claims

1. A process for desulfurization of exhaust gases and recovery of gypsum as a by-product which comprises contacting said gases with an aqueous slurry containing 0.05–1.5 mole/l of undissolved gypsum, lime that is reactive with the oxidized sulfur gases, at least 0.001 mole/l of a dicarbonyl acid component represented by the general formula: HOOCRCOOH (where R represents ethylene group, hydroxyethylene group, dihydroxyethylene group, or vinylene group), at least 0.001 mole/l of sulfuric acid, and an alkali salt from the group consisting of salts of Li, K, Na, Rb, Cs, NH_3 and Mg, maintaining said slurry at a pH value of 3–5, adding oxygen to oxidize the sulfur components to sulfates, continuously adding lime to said slurry in amount sufficient to react with said sulfur components, whereby the sulfur components of said gas are absorbed and oxidized and converted to gypsum, and continuously removing a portion of said slurry and separating the gypsum therefrom for recovery and recycling the mother liquor to the absorption step described above.

4,203,955
PROCESS OF PREPARING CALCIUM HYDROGEN PHOSPHATE ANHYDRIDE SUITABLE AS MATERIAL FOR PHOSPHORS

Takamitsu Enomoto; Kyōji Tanaka, both of Ube; Hiromi Kawamoto, Onoda; Tamotsu Mizuno, and Masao Fujinaga, both of Ube, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 8, 1978, Ser. No. 931,902

Claims priority, application Japan, Aug. 9, 1977, 52/94672; Aug. 9, 1977, 52/94673

Int. Cl.[2] C01B *25/32*

U.S. Cl. 423—308 5 Claims

1. A process of preparing calcium hydrogen phosphate

anhydride suitable as a raw material for phosphate phosphors, the process comprising the steps of:

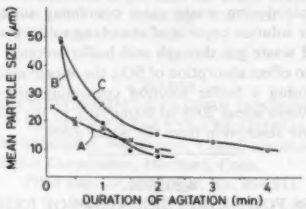
(a) adding a water soluble calcium salt to an aqueous solution of sodium ammonium hydrogenphosphate in such an amount that the Ca/P mole ratio in the resultant solution becomes 0.01–0.10 thereby to cause precipitation of a small quantity of calcium hydrogen phosphate dihydrate;

(b) removing the precipitate from the resultant solution thereby to lower the content of Fe of said sodium ammonium hydrogenphosphate;

(c) preparing an aqueous solution of sodium ammonium hydrogenphosphate treated in steps (a) and (b) so a to contain less than 50 g/l of P_2O_5;

(d) adding a water soluble phosphate to an aqueous solution of calcium chloride in such an amount that the P/Ca mole ratio in the resultant solution becomes 0.005-0.05 thereby to cause precipitation of a small quantity of calcium hydrogen phosphate dihydrate;

(e) removing the precipitate from the resultant solution thereby to lower the content of Fe of said calcium chloride;



(f) preparing an aqueous solution of calcium chloride treated in steps (d) and (e) so as to contain less than 70 g/l of $CaCl_2$;

(g) mixing said solution prepared in step (c) with said solution prepared in step (f) at temperatures between 5° C. and 40° C.;

(h) separating the precipitated calcium hydrogen phosphate from solution;

(i) preparing an acidified water containing a mineral acid selected from the group consisting of nitric acid, hydrochloric acid and phosphoric acid in such an amount that the pH of said water is in the range from 1.0 to 5.0;

(j) maintaining said acidified water at a temperature above 80° C.;

(k) putting a batch of the calcium hydrogen phosphate dihydrate separated from said solution into said acidified water maintained at said temperature all at once to form a hot aqueous slurry of calcium hydrogen phosphate dihydrate in a concentration below 40% by weight; and

(l) agitating said hot slurry thereby to convert said calcium hydrogen phosphate dihydrate in said slurry to crystalline calcium hydrogen phosphate anhydride.

4,203,956

PROCESS AND APPARATUS FOR RECOVERING ALCOHOLIC PHOSPHORIC ACID SOLUTIONS FROM ACID PHOSPHATES

Klaus Schröter, Cologne; Wolfgang Scheibitz, Hürth -Knapsack, and Klaus-Peter Ehlers, Erftstadt-Lechenich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Hürth-Knapsack, Fed. Rep. of Germany

Continuation of Ser. No. 765,639, Feb. 4, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,501

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605106

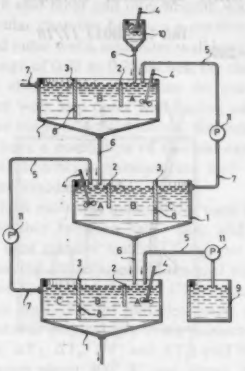
Int. Cl.[2] C01B *25/22*

U.S. Cl. 423—321 S **5 Claims**

1. In the process for making alcoholic phosphoric acid solutions from an aqueous solution or aqueous suspension of acid phosphates or phosphate mixtures in the presence of a strong mineral acid by contacting countercurrently said aqueous phosphate with at least one alcohol having from 3 to 8 carbon atoms and a strong mineral acid, employing said alcohol and said aqueous phosphate in a ratio by volume of 2:1 to 20:1, the improvement which comprises the combination of the steps:

(a) using sulfuric acid as the mineral acid,

(b) mixing the sulfuric acid with said alcohol prior to contacting said alcohol with said aqueous phosphate,



(c) employing the sulfuric acid in a quantity just that stoichiometrically necessary to transform the phosphates to free phosphoric acid and neutral mineral salts,

(d) using said alcohol, sulfuric acid and said aqueous phosphate with such a water content to establish in the resulting mixture of these substances a total water content necessary to ensure the formation of an alcoholic phase and a separate flowable salt phase, and

(e) separating the salt phase from the alcoholic phase.

4,203,957

MODIFIED PHOSPHORUS FURNACE OPERATION

James S. Medves, St. Johns, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed Feb. 21, 1978, Ser. No. 879,111

Claims priority, application Canada, Dec. 23, 1977, 293866

Int. Cl.[2] C01B *25/01*

U.S. Cl. 423—323 **4 Claim**

1. A process for the production of phosphorus by the elec trothermal method in an electrothermal phosphorus furnace which comprises

providing a reactants charge to the furnace having less tha about 2% by weight moisture and comprising agglomer ated phosphate rock sized such that not more than abou 6% by weight thereof passes through an 8 mesh scree and coke and silica particles sized such that not more tha about 6% by weight thereof passes through a 6 mes screen,

forming gaseous products in said furnace consisting esse tially of phosphorus vapour, carbon dioxide gas and ass ciated dust having a temperature of about 200° C. to le than 300° C. at the gaseous outlet from said furnace,

conducting said gaseous products by a single continuou duct directly from the furnace to wet phosphorus co densers in the absence of electrostatic duct precipitati equipment between said furnace and said condense while maintaining a positive pressure in said duct exert by said gaseous products which does not exceed about inch of water at said furnace outlet and which decreases value along the length of said duct, whereby the ingress external air to the gaseous products is avoided,

said duct including a first short upwardly-extending du portion from the furnace gaseous outlet and a second lo

downwardly-extending portion from the upper extremity of said first portion to said condensers, said second duct portion having a sufficiently steep angle to cause phosphorus condensing therein to flow to said condensers,

other than may be intermittently required to remove accumulated dust in the duct, avoiding the introduction of water to the duct from external sources, and

condensing and recovering phosphorus in said condensers from the gaseous products conveyed thereto by said duct.

4,203,958

PROCESS FOR PRODUCING OXYGEN-FREE NITROGEN ATMOSPHERE

Thomas R. Snarski, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1978, Ser. No. 883,598

Int. Cl.² C01B *21/00*

U.S. Cl. 423—351 **2 Claims**

1. In the process of generating a substantially O_2-free, decarbonized nitrogen atmosphere including the principal steps of (a) burning a combustible gas in a generator in the presence of air to yield a generator gas comprising nitrogen, carbonaceous products and water, (b) scrubbing the generator gas with water to clean and cool it, (c) passing the scrubbed gas through an adsorbent bed for adsorbing said carbonaceous products and water from said generator gas to yield a substantially O_2-free nitrogen effluent, and (d) flushing said bed with said effluent under vacuum to regenerate said bed in a separate desorption cycle, the improvement comprising:

prior to said flushing with said effluent, flushing said bed with an air-rich gas under vacuum for a sufficient time to desorb said adsorbed carbonaceous products and water whereby the duration of said effluent flushing may be reduced to a time sufficient only to purge said bed of said air and conservation of said effluent and said combustible gas is achieved.

4,203,959

PROCESS FOR THE PREPARATION OF NITROUS OXIDE

Gerhard Münster, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,040

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811181

Int. Cl.² C01B *21/22*

U.S. Cl. 423—400 **5 Claims**

1. Process for the preparation of nitrous oxide, which comprises introducing into an aqueous solution having a pH value of from 0 to 3 an inorganic nitrite and an inorganic SO_2 source, while applying molar ratios of nitrite to sulfite of from 1:1 to 1:1.5.

4,203,960

COKE DESULPHURIZATION

William V. Bauer, New York, N.Y.; Jose A. C. Isaacs, and Oliverio M. Lamonte, both of Edo de Mexico, Mexico, assignors to The Lummus Company, Bloomfield, N.J.

Filed Aug. 15, 1978, Ser. No. 933,809

Int. Cl.² C01B *31/02*; C10B *57/00*

U.S. Cl. 423—461 **22 Claims**

1. A process for effecting desulphurization of a sulphur containing coke, comprising:

sequentially heating coke to coke desulphurization temperatures, soaking said coke at coke desulphurization temperatures to effect desulphurization thereof, said coke reaching a temperature of at least 1000° C. during said desulphurization, and cooling said coke to below the desulphurization temperature, said cooling being effected by passing a gas in direct contact with said coke, said gas being at a temperature below the temperature of said coke during said cooling, at least a portion of said heating of the coke being effected by passing said gas subsequent to said cooling in direct contact with said coke with the gas being at a temperature above the temperature of said coke, at least one of said coke and said gas being heated between said direct contact heating and cooling, whereby heat released from the cooling is recuperated by said gas and employed to provide most of the heat required to heat to desulphurization temperatures, said gas employed for said cooling and heating of the coke being a recycle gas provided by recycling at least a portion of the gas recovered from the direct contact heating to the direct contact cooling, said recycle gas consisting essentially of nitrogen and hydrogen and combustible matter derived from the coke.

4,203,961

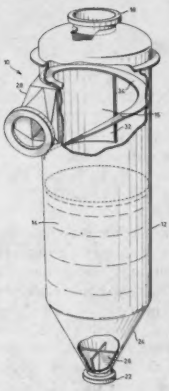
CHLORINE DIOXIDE GENERATION PROCESS

Gerald Cowley, Mississauga, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed Nov. 29, 1978, Ser. No. 964,681

Int. Cl.² C01B *11/02*

U.S. Cl. 423—478 **7 Claims**



1. In a continuous method for the production of chlorine dioxide, which comprises:

continuously maintaining a chlorine dioxide-producing reaction medium in an enclosed upright cylindrical reaction zone having a vapor space located above the liquid level of said reaction medium in said reaction zone, the reaction medium containing an alkali metal chlorate, a reducing agent capable of reducing said alkali metal chlorate to chlorine dioxide and chlorine, and a strong mineral acid,

continuously generating chlorine dioxide and chlorine from said reaction medium and continuously evaporating water from said reaction medium at substantially the boiling point thereof while the reaction zone is maintained under a subatmospheric pressure,

continuously removing from said reaction zone a gaseous mixture of said generated chlorine dioxide and chlorine and evaporated water through a gaseous outlet located in communication with said vapor space in said reaction zone,

continuously depositing in said reaction zone an alkali metal salt of the anion of said strong acid, removing from a lower portion of said reaction zone a slurry containing deposited alkali metal salt and part of said reaction medium and recovering alkali metal salt from a portion of said slurry,

admixing alkali metal chlorate with said remainder of said slurry,

heating recycled material substantially to an elevated tem-

perature which is the boiling point of the reaction medium at the prevailing absolute pressure in said reaction zone,

accelerating the heated material in admixture with alkali metal chlorate, and also reducing agent when said strong mineral acid is not also the reducing agent, to establish a back pressure exceeding the difference in saturation vapor pressure of the heated mixture and of said reaction medium,

adding strong mineral acid to said accelerated heated mixture substantially at the maximum velocity of said mixture resulting from said acceleration to provide a feed material for said reaction zone,

allowing gaseous material in said feed material to expand while maintaining a low rate of acceleration, and

feeding said expanded feed mixture into said vapor space,

the improvement which comprises effecting said feeding of expanded feed mixture into said vapor space generally tangentially of the internal wall of said reaction zone, and

inducing said gaseous material to follow the flow path of said expanded feed mixture from inlet to said reaction zone to said reaction medium and to flow radially inwardly of the internal wall of the reaction zone prior to upward passage through said vapor space towards said gaseous outlet.

4,203,962

PROCESS FOR CONSOLIDATION OF FINE ALUMINA PARTICLES

Alfred Lippman, Metairie, La., assignor to Toth Aluminum Corporation, New Orleans, La.

Filed Aug. 24, 1978, Ser. No. 936,508
Int. Cl.[2] C01F *7/02*
U.S. Cl. 423—625 **10 Claims**

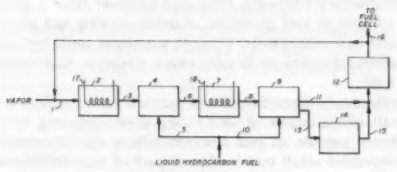
1. A method for making granules from ultrafine alumina particles comprising the following steps: (1) admixing ultrafine alumina particles with a solution of an alkali metal hydroxide or equivalent alkali in a maximum amount of 0.7 percent equivalent Na_2O by weight based on dry alumina; (2) compressing the mixture obtained in step (1); (3) autoclaving the compressed mixture obtained in step (2) at a temperature of at least 150° C. for at least three hours; (4) drying and calcining the autoclaved compressed mixture obtained in step (3); and (5) comminuting the dried and calcined mass obtained in step (4) to form granules.

4,203,963

STAGED VAPORIZATION OF LIQUID HYDROCARBON FUELS

Glenn W. Scheffler, Tolland, and Yasar Tanrikut, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,381
Int. Cl.[2] C01B *1/13*
U.S. Cl. 423—650 **17 Claims**



1. In a method for producing a hydrogen rich gas utilizing the vaporization of a liquid hydrocarbon fuel, the improvement comprising the steps of:

dividing a liquid hydrocarbon fuel into at least two portions;

staged vaporization of said fuel portions, said staged vaporization including:

a first stage wherein a first portion of the liquid hydrocarbon fuel is mixed with a heated vapor having a specific heat in the range of about 0.2 to 1 Btu/lb°F., said vapor having a sufficient temperature and heat transfer capability to cause vaporization of essentially all of the first fuel portion to provide a first vapor product;

heating said first vapor product; and

successive stages of mixing and heating to vaporize essentially all of the remaining portions of liquid fuel to provide a final vapor product, the successive stages mixing the vapor product from a preceding stage with a portion of the liquid fuel; and

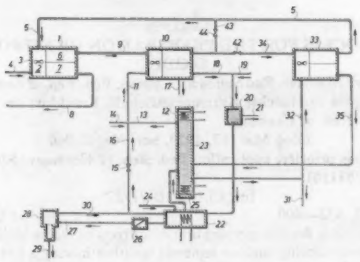
reacting the final vapor product in a reforming zone to produce a hydrogen rich gas.

4,203,964

RE-EXTRACTING METAL CHLORIDE COMPLEX FROM AN ORGANIC EXTRACTION SOLUTION

Hans Reinhardt, and Ulf V. Kuylenstierna, both of Västra Frölunda, Sweden, assignors to MX-Processer Reinhardt & Co. AB, Mölindal, Sweden

Filed Jul. 3, 1978, Ser. No. 921,177
Claims priority, application Sweden, Jul. 20, 1977, 7708387; Dec. 14, 1977, 7714219
Int. Cl.[2] C01B *17/96, 7/01*
U.S. Cl. 423—658.5 **7 Claims**



1. A process for the re-extraction of a metal from an organic extraction solution in which the metal is presented as a metal chloride complex bonded to an extractant, characterized in contacting the organic extraction solution with an aqueous solution to transfer metal ions and chloride ions to the aqueous solution, adding a sulphuric acid solution to the aqueous solution, either before or before and after the contact with the organic extraction solution, heating the thusly acidified aqueous solution to drive off hydrogen chloride and water, crystallizing metal sulphate from the concentrated solution thus produced, and separating the crystallized metal sulphate from the solution.

4,203,965

Patent Not Issued For This Number

4,203,966

DENTIFRICE WITH TOPICAL AND SYSTEMIC PHOSPHATE FLUORIDE SYSTEM

Frank R. Faunce, Houston, Tex., assignor to William F. McCord, Pasadena, Tex.

Continuation of Ser. No. 826,718, Aug. 22, 1977, abandoned. This application Dec. 28, 1978, Ser. No. 973,910

Int. Cl.[2] A61K 7/18

U.S. Cl. 424—52 7 Claims

1. A two component ingestible dentifrice composition comprising:

a first topical dentifrice composition component including an abrasive material, a carrier material, a binder, a sweetening agent, a flavoring agent and an effective amount of an acid phosphate compound to impart a pH of about 3.5;

a second systemic and topically effective but otherwise unstable fluoride composition incorporated within a water free carrier gel; and

a lipid coating material coating said systemic fluoride compound of said dentifrice composition, said coating being broken down by the acid fluid of the stomach to release fluoride in the stomach for absorption by the mucosa, said acid phosphate paste dentifrice, when reacted together with said gel of coated fluoride during a toothbrushing sequence, providing a tooth decay inhibiting complex fluoride fluorophosphate compound at an energized tooth surface etched by said acid phosphate compound.

4,203,967

DIAGNOSTIC TEST FOR MALABSORPTION

Hugo E. Gallo-Torres, Livingston, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 759,221, Jan. 13, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,818

Int. Cl.[2] A61K 29/00

U.S. Cl. 424—9 9 Claims

1. A method for testing for malabsorption in a patient comprising:

(a) orally administering to said patient who had fasted overnight N-(2-aminoethyl)-glycine;

(b) collecting the urine from said patient during the eight hours following said administration; and

(c) contacting a sample of the urine with an indicator substance which colorimetrically indicates the presence of N-(2-aminoethyl)-glycine thereby colorimetrically determining the amount of N-(2-aminoethyl)-glycine in the urine.

4,203,968

COMBINATION VACCINE FOR SWINE DYSENTERY AND METHOD OF USE

Delbert L. Harris, Ames, Iowa; Robert A. Goodnow, Omaha, Nebr.; Robert D. Glock, and Joann M. Kinyon, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa and Burns-Biotec Laboratories, Inc., Omaha, Nebr.

Division of Ser. No. 935,000, Aug. 18, 1978, Pat. No. 4,152,414. This application Mar. 1, 1979, Ser. No. 16,623

Int. Cl.[2] A61K 39/02

U.S. Cl. 424—92 5 Claims

1. A parenteral preparation for increasing the resistance of swine to swine dysentery infection, comprising an injectable cell concentrate containing killed cells of a virulent isolate of *Treponema hyodysenteriae* in combination with killed cells of *Bacteroides vulgatus,* and *Bacteroides vulgatus* being present in an amount of from 0.25 to 2 parts by weight (dry basis) per part of said *Treponema hyodysenteriae.*

4,203,969

DITHRANOL COMPOSITIONS FOR TOPICAL APPLICATIONS

Hyman Yarrow, Hitchin, and Martin Whitefield, London, both of England, assignors to Drythanol Limited, London, England

Filed Apr. 28, 1978, Ser. No. 900,861

Claims priority, application United Kingdom, Jul. 6, 1977, 28410/77

Int. Cl.[2] A61K 31/745, 31/05

U.S. Cl. 424—83 11 Claims

1. A composition for topical application comprising:

0.01 to 1% of dithranol;

0.05 to 5% of a water-soluble, oil-insoluble acid antioxidant or of a combination of a water-soluble, oil-insoluble acid and a water-soluble, oil-insoluble antioxidant;

20 to 60% of petroleum jelly, along or mixed with a spreadable synthetic hydrocarbon rubber, in which dithranol is soluble;

25 to 60% of water in which the said acid-antioxidant or combination of acid and antioxidant is dissolved; and

5 to 20% of an emulsifier to maintain as a stable emulsion the said petroleum jelly, alone or mixed with a spreadable synthetic hydrocarbon rubber, as a discontinuous oil phase dispersed in a continuous aqueous phase;

the said precentages being by weight based on the total weight of the composition;

the dithranol being substantially completely retained in the discontinuous oil phase, and the acid-antioxidant or combination of acid and antioxidant being dissolved in and substantially completely retained in the continuous aqueous phase,

whereby when in said composition the dithranol is protected from oxidation during storage but when the composition is applied to the skin the water in said aqueous phase evaporates or is absorbed by the skin and the dithranol is made available.

4,203,970

SWINE ATROPIC RHINITIS VACCINE

Dennis J. Carlo, Rahway; Arpi Hagopian, and Peter J. Kniskern, both of Sayreville, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 5, 1979, Ser. No. 17,528

Int. Cl.[2] A61K 39/02

U.S. Cl. 424—92 5 Claims

1. An immunogenic sub-cellular cell wall antigenic fraction of *Bordetalla bronchiseptica* contains in part by weight at least about 53% Lowry protein, from about 10 to about 13% carbohydrate, of which about 19% is hexose and about 19% is hexosamine, from about 1 to about 1.4% sialic acid, and about 0.18% KDO.

4,203,971
NEISSERIA GONORRHOEAE VACCINE

Thomas M. Buchanan, Seattle, Wash., assignor to Government of the United States, Washington, D.C.

Filed Mar. 23, 1978, Ser. No. 889,343
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 2 Claims

1. A vaccine for protecting humans against infection by *Neisseria gonorrhoeae* microorganisms containing at least one POMP antigen free of contaminants which are toxic to humans characterized by the ability to elicit a bactericidal response in humans, consisting essentially of subunits with molecular weights of from 34,000 to 39,000 Daltons, containing both hydrophobic and hydrophilic groups and having a carbohydrate content of about 4% and a protein content of about 96% by weight.

4,203,972
PENICILLIN COMPOSITION

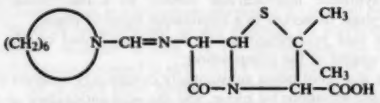
Peter Bamberg, Zürich, Switzerland; Bertil A. Ekström, Södertälje, Sweden; Ulf E. Forsgren, Gävle, Sweden, and Berndt O. H. Sjöberg, Södertälje, Sweden, assignors to Astra Pharmaceutical Products, Inc., Framingham, Mass.

Continuation-in-part of Ser. No. 464,157, Apr. 25, 1974, which is a continuation-in-part of Ser. No. 302,423, Oct. 31, 1972, abandoned. This application Mar. 23, 1978, Ser. No. 889,410
Claims priority, application United Kingdom, Nov. 1, 1971, 50675/71
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—114 8 Claims

1. An antibacterial synergistic composition comprising a mixture of

(a) the penicillin 6-(D-α-amino-p-hydroxyphenylacetamido)penicillanic acid or its pharmaceutically acceptable salts (A); and

(b) a penicillin of the formula



or pharmaceutically acceptable salts or pharmaceutically acceptable in vivo rapidly hydrolyzed esters thereof (C); said composition containing the compounds of formulas A and C in a weight ratio ranging from 10:1 to 1:10.

4,203,973
ANTIBIOTICS

Martin Cole, Dorking; John D. Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, England

Division of Ser. No. 724,948, Sep. 20, 1976, which is a continuation-in-part of Ser. No. 691,491, Jun. 1, 1976, abandoned, which is a division of Ser. No. 559,973, Mar. 19, 1975, abandoned. This application Jun. 7, 1978, Ser. No. 913,304
Claims priority, application United Kingdom, Mar. 28, 1974, 13855/74
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—114 26 Claims

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a pharmaceutically acceptable dibasic salt of MM 4550A which is at least 70% pure and an antibacterially effective amount of amoxycillin which substance MM4550A is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_9N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:

(a) in aqueous solution, it has a characteristic ultraviolet spectrum with absorption maxima at about 238 nm and at about 287 nm;

(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum substantially as shown in FIG. 2 and has absorption maxima at inter alia about 3450, 2950, 1765, 1695, 1510, 1390 and 1260 cm^{-1};

(c) it has a characteristic n.m.r. spectrum which when taken in D_2O is substantially as shown in FIG. 3, which spectrum possesses inter alia (i) a pair of low field doublets centred approximately at 2.45τ and 3.65τ with coupling constants of approximately 15 Hz; (ii) a doublet centred at approximately 8.55τ; and (iii) a sharp singlet at approximately 7.95τ;

(d) it possesses antibacterial activity against various species including inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Acinetobacter anitratus, Serratia marcescens* and *Shigella sonnei;*

(e) it syngegizes the antibacterial activity of ampicillin against certain β-lactamase producing bacteria including stains of *Escherichia coli, Klebsiella aerogenes, Proteus mirabilis,* and *Staphylococcus aureus Russell;* and

(f) it is not a polypeptide or protein, in combination with a pharmaceutically acceptable carrier, said di-basic salt of MM 4550A and said *amoxycillin* being present in the ratio of 10:1 to 1:10.

4,203,974
STABLE AQUEOUS FOAM FORMULATION, AND METHOD OF USE THEREOF FOR VISUAL OBSCURATION AND AREA DENIAL

Harry A. Brown, Jr., Fallston, and Robert F. Durgin, Abingdon, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 15, 1978, Ser. No. 886,961
Int. Cl.[2] A01N *11/00;* B01J *13/00*
U.S. Cl. 424—166 11 Claims

1. A stable aqueous foam formulation comprising, in a single composite solution, a conventional high expansion foam liquid concentrate consisting essentially of a sodium lauryl sulfate surfactant as a principal active ingredient in aqueous solution, a glycerin thickener, a sucrose stabilizer and a relatively large amount of ammonia in aqueous solution sufficient to act as an irritant deterrent to persons exposed to said foam formulation.

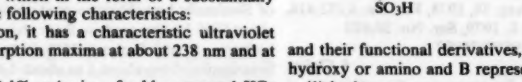
6. In a method for obtaining visual obscuration and area denial in military operations through dissemination of a high expansion aqueous foam, the improvement comprising the step of using a stable, aqueous foam formulation which comprises a single composite aqueous solution of a conventional high expansion foam liquid consisting essentially of a sodium lauryl sulfate surfactant as a principal active ingredient, a glycerin thickener, a polyhydroxylated stabilizer and a relatively large amount of ammonia as an irritant deterrent to persons exposed to said foam.

4,203,975
PSYCHOPHARMACOLOGICAL PEPTIDES SUITABLE FOR THERAPEUTIC ADMINISTRATION

Hendrik M. Greven, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jun. 30, 1978, Ser. No. 921,067
Claims priority, application Netherlands, Jul. 13, 1977, 7707781
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 18 Claims

1. Compounds of the formula:



and their functional derivatives, wherein X_1 and X_2 represent hydroxy or amino and B represents:

(1) hydroxy or

(2) an amino-acid residue selected from the group consisting of L-Asp-OH, L-Asn-OH, L-Glu-OH, L-Gln-OH, L-Ser-OH, or HN-A-COOH, wherein A is an alkylidene group with one to about six carbon atoms.

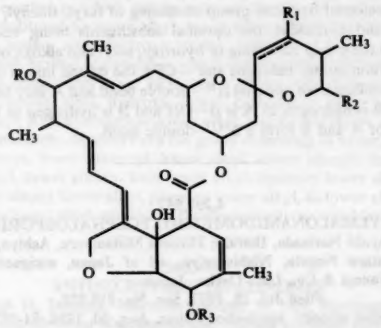
4,203,976

SUGAR DERIVATIVES OF C-076 COMPOUNDS

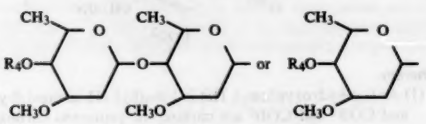
Michael H. Fisher, Bridgewater, and Richard L. Tolman, Berkeley Heights, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 2, 1978, Ser. No. 930,466
Int. Cl.[2] A61K 31/35; C07H 17/08
U.S. Cl. 424—180 18 Claims

1. A compound having the formula:



wherein the broken line indicates a single or double bond;
R_1 is hydroxy, loweralkanoyloxy, or glycosyloxy and is present only when the broken line indicates a single bond;
R_2 is n-propyl or sec-butyl;
R_3 is hydrogen, methyl, loweralkanoyl or glycosyl; and
R is hydrogen, loweralkanoyl, glycosyl,



wherein R_4 is hydrogen, loweralkanoyl or glycosyl; wherein said glycosyl groups are polyhydroxy 5- or 6-membered cyclic acetals which are optionally substituted on the ring carbon atoms with loweralkyl and in which the hydroxy groups may be optionally substituted with loweralkyl or loweralkanoyl, and the monosaturated glycosyl derivatives thereof;

provided that at least one of R, R_1, R_3 or R_4 must contain a glycosyl group, however, when only R contains a glycosyl group, said glycosyl group of R shall exclude the α-L-oleandrosyl and α-L-oleandrosyl-α-L-oleandrosyl groups.

17. A method for the treatment of helmintic, arthropod ectoparasitic, and acaridal infections which comprises administering to an animal infected with such helminths, arthropod ectoparasites or acarides an effective amount of a compound of claim 1.

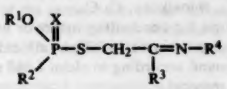
4,203,977

PHOSPHORIC ACID ESTERS, COMPOSITION AND USE

Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,152
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746057
Int. Cl.[2] C07F 9/165; A01N 9/36
U.S. Cl. 424—211 9 Claims

1. A phosphoric (phosphonic) acid ester of the formula



I,

where R^1 denotes linear or branched alkyl of up to 4 carbon atoms, R^2 denotes linear or branched alkoxy or alkylthio, each of up to 4 carbon atoms R^3 denotes amino, mono- or di-alkylamino of up to 4 carbon atoms in each alkyl, alkylalkoxy-alkyl-amino of up to 4 carbon atoms in each alkyl or alkoxyalkyl, di-alkoxyalkylamino of up to 4 carbon atoms in each alkoxyalkyl, alkylalkenylamino of up to 4 carbon atoms in each alkyl or alkenyl, alkylalkynylamino of up to 4 carbon atoms in each alkyl or alkynyl, N-methyl-N-methoxyamino, R^4 denotes alkylsulfonyl or haloalkylsulfonyl of up to 4 carbon atoms in each alkyl or haloalkyl, and X denotes oxygen or sulfur.

8. Pesticides for insects, mites and ticks comprising a solid and/or liquid carrier and an amount of a phosphoric (phosphonic) acid ester of the formula I sufficient to kill said insects, mites or ticks.

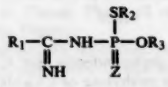
4,203,978

AMIDINO-PHOSPHORIC ACID THIOL ESTERS FOR COMBATING PESTS

Elmar Sturm, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 862,695, Dec. 21, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,335
Claims priority, application Switzerland, Dec. 30, 1976, 16473/76; Mar. 4, 1977, 2721/77
Int. Cl.[2] A01N 9/36; C07F 9/24
U.S. Cl. 424—211 20 Claims

1. A compound of the formula I



(I)

wherein
R_1 represents hydrogen, C_1-C_4-alkyl or cyclopropyl,
R_2 represents C_3-C_5-alkyl, and
R_3 represents methyl or ethyl, whilst
Z represents oxygen or sulphur.

19. A method of combating nematodes at a locus which comprises applying to the locus an effective amount of a compound according to claim 1.

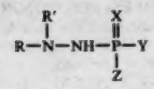
4,203,979

INSECTICIDAL 1-SEC. AND TERT.-ALKYL-2-DISUBSTITUTED-PHOSPHORYL HYDRAZINES

Michael J. Brown, Randolph, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 16, 1979, Ser. No. 3,959
Int. Cl.[2] A01N 9/36; C07F 9/24
U.S. Cl. 424—220 18 Claims

1. Compounds of the formula:



where

R is a secondary or tertiary alkyl, C_4-C_{10},

R' is hydrogen, alkyl, C_1-C_6 or acetyl,

X is oxygen or sulfur, and,

Y and Z are independently alkyl, C_1-C_6, alkenyl, C_2-C_6, alkoxy, C_1-C_6, thioalkoxy, C_1-C_6.

17. A composition for combatting insect or mite pests at a locus which comprises an insecticidally or miticidally effective amount of a compound according to claim **1** and an acceptable diluent or carrier material.

18. A method of combatting insect or mite pests at a locus which comprises treating the locus with an insecticidally or miticidally effective amount of a composition according to claim **17**.

4,203,980

BENZYLPYRIMIDINE DERIVATIVES

Ivan Kompis, Oberwil, and Alexander E. Wick, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

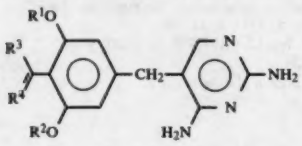
Filed Apr. 26, 1978, Ser. No. 900,357

Claims priority, application Luxembourg, May 5, 1977, 77269; Switzerland, Mar. 10, 1978, 2650/78

Int. Cl.[2] A61K *31/635;* **C07D** *239/48*

U.S. Cl. 424—229 **16 Claims**

1. A compound of the formula

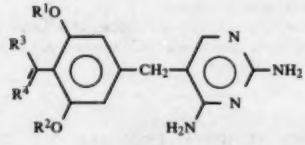


I

wherein R^1 and R^2, independently, are C_{1-6}-alkyl, R^3 is C_{1-3}-alkyl and R^4 is methylene or C_{2-4}-alkylidene,

or a physiologically acceptable acid addition salt thereof.

14. An antibacterial pharmaceutical composition comprising a compound of the formula



I

wherein R^1 and R^2, independently, are C_{1-6}-alkyl, R^3 is C_{1-3}-alkyl and R^4 is methylene or C_{2-4}-alkylidene,

or a pharmaceutically acceptable acid addition salt thereof, an antibacterially active sulfonamide and a compatible pharmaceutical carrier material, said compound of formula I being present in an amount sufficient to potentiate the antibacterial activity of the sulfonamide.

4,203,981

NOVEL 17 α-ARYL-STEROIDS

André Pierdet, Noisy-le-Sec; Vesperto Torelli, Maisons-Alfort, and Roger Deraedt, Les Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

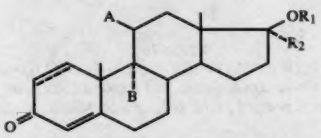
Filed Jan. 3, 1979, Ser. No. 692

Claims priority, application France, Jan. 11, 1978, 78 00658

Int. Cl.[2] C07J *23/00;* **A61K** *31/56*

U.S. Cl. 424—243 **37 Claims**

1. A compound of the formula



I

wherein R_1 is selected from the group consisting of hydrogen and acyl of an organic carboxylic acid of 1 to 18 carbon atoms, R_2 is selected from the group consisting of optionally substituted phenyl and benzyl and optionally substituted heterocyclic selected from the group consisting of furyl, thienyl, pyridyl and pyrimidyl, the optional substituents being selected from the group consisting of hydroxy, alkyl and alkoxy of 1 to 4 carbon atoms, halogens and $-CF_3$, the dotted line in the A ring indicates an optional $\Delta^{1(2)}$-double bond and A may be oxo and B is hydrogen or A is β—OH and B is hydrogen or halogen or A and B form a $\Delta^{9(11)}$-double bond.

4,203,982

ARYLMALONAMIDOMETHOXYCEPHALOSPORINS

Masayuki Narisada, Ibaraki; Hiromu Matsumura, Ashiya, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

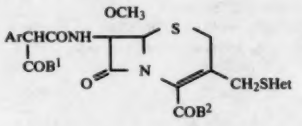
Filed Jul. 28, 1977, Ser. No. 819,931

Claims priority, application Japan, Aug. 10, 1976, 51-95732

Int. Cl.[2] C07D *501/36*

U.S. Cl. 424—246 **8 Claims**

1. A compound of the formula:



wherein

(1) Ar is p-hydroxyphenyl, Het is 1-methyl-1H-tetrazol-5-yl, and COB^1 and COB^2 are carboxy or protected carboxy groups;

(2) Ar is p-carbamoyloxyphenyl, Het is 1-methyl-1H-tetrazol-5-yl, and COB^1 and COB^2 are carboxy or protected carboxy groups;

(3) Ar is 2-fluoro-4-hydroxyphenyl, Het is 1-methyl-1H-tetrazol-5-yl, and COB^1 and COB^2 are carboxy or protected carboxy groups;

(4) Ar is 2-thienyl, Het is 1-methyl-1H-tetrazol-5-yl, and COB^1 and COB^2 are carboxy or protected carboxy groups; or

(5) Ar is 3-thienyl, Het is 1-methyl-1-H-tetrazol-5-yl, and COB^1 and COB^2 are carboxy or protected carboxy groups,

and pharmaceutically acceptable salts thereof.

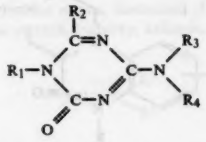
3. An antibacterial pharmaceutical composition comprising an effective antibacterial amount of a compound according to claim **1** and a pharmaceutically acceptable carrier.

4,203,983
SPASMOLYTIC TRIAZINONES

John Yelnosky, Warrington; George H. Douglas, Malvern; Ghulam N. Mir, Buckingham, and Chong M. Won, Warrington, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Nov. 13, 1978, Ser. No. 959,840
Int. Cl.[2] A61K *31/53, 31/54, 31/535*
U.S. Cl. 424—249 12 Claims

1. A method for treating smooth muscle spasms which comprises administering to a patient in need of such therapy by oral, parenteral or anal routes an effective amount of an antispasmodic agent of the formula:



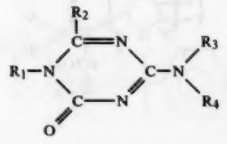
wherein R_1 is phenyl, benzyl or phenethyl; or phenyl, benzyl or phenethyl in which one or more of the phenyl hydrogens are substituted by lower alkyl, lower alkoxy, halo, halo-lower alkyl, amino, nitro, hydroxy, cyano, carboxyl or lower alkyl sulfonyl; pyridyl or pyridyl in which one or more of the hydrogens is replaced by lower alkyl, lower alkoxy, halo, halo-lower alkyl, amino, nitro, hydroxy, cyano, carboxyl or lower alkyl sulfonyl; R_2 is hydrogen or lower alkyl, and R_3 and R_4 are each independently selected from the group consisting of hydrogen, hydroxyl, lower alkanoyl, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, halo lower alkyl, hydroxy lower alkyl, lower alkoxy lower alkyl, phenoxy lower alkyl, di-lower alkyl-amino lower alkyl; and their pharmaceutically acceptable salts.

4,203,984
ANTISECRETORY TRIAZINONES

George H. Douglas, Malvern; Ghulam N. Mir, Buckingham; Chong M. Won, Warrington, and William L. Studt, Harleysville, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Nov. 13, 1978, Ser. No. 959,950
Int. Cl.[2] A61K *31/53, 31/54, 31/535*
U.S. Cl. 424—249 9 Claims

1. A method for inhibiting or suppressing the activity of the secretory glands in the gastrointestinal tract which comprises administering by oral or parenteral route to a patient suffering from hypersecretion an effective amount of an antisecretory composition consisting essentially of an inert pharmaceutical carrier and an effective antisecretory amount of a compound of the formula:



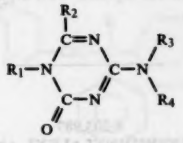
wherein R_1 is phenyl, benzyl or phenethyl; or phenyl, benzyl or phenethyl in which one or more of the phenyl hydrogens are substituted by lower alkyl, lower alkoxy, halo, halo lower alkyl, amino, nitro, hydroxy, cyano, carboxyl, or lower alkyl sulfonyl; pyridyl or pyridyl having one or more hydrogens replaced by lower alkyl, lower alkoxy, halo, halo lower alkyl, amino, nitro, hydroxy, cyano, carboxyl, or lower alkyl sulfonyl; R_2 is hydrogen or lower alkyl, and R_3 and R_4 are each independently selected from the group consisting of hydrogen, hydroxyl, lower alkanoyl, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, halo lower alkyl, hydroxy lower alkyl, lower alkoxy lower alkyl, phenoxy lower alkyl, di-lower alkyl-amino lower alkyl; and their pharmaceutically acceptable salts.

4,203,985
ANTIDIARRHEAL TRIAZINONES

John Yelnosky, Warrington; George H. Douglas, Malvern; Ghulam N. Mir, Buckingham; Dahyabhai M. Patel, Ambler; Chong M. Won, Warrington, and Ronald L. Alioto, Havertown, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Nov. 13, 1978, Ser. No. 959,722
The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.
Int. Cl.[2] A61K *31/53, 31/54, 31/535*
U.S. Cl. 424—249 16 Claims

1. A pharmaceutical composition suitable for treating diarrhea comprising an effective amount of a compound of the formula:



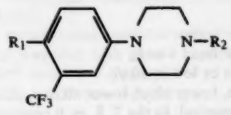
wherein R_1 is phenyl, benzyl or phenethyl; or phenyl, benzyl or phenethyl in which one or more of the phenyl hydrogens are substituted by lower alkyl, lower alkoxy, halo, halo-lower alkyl, amino, nitro, hydroxy, cyano, carboxyl or lower alkyl sulfonyl; pyridyl or pyridyl having one or more of the hydrogens replaced by lower alkyl, lower alkoxy, halo, halo-lower alkyl, amino, nitro, hydroxy, cyano, carboxyl or lower alkyl sulfonyl; R_2 is hydrogen or lower alkyl, and R_3 and R_4 are each independently selected from the group consisting of hydrogen, hydroxyl, lower alkanoyl, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, halo lower alkyl, hydroxy lower alkyl, lower alkoxy lower alkyl, phenoxy lower alkyl and di-lower alkyl-amino lower alkyl and their pharmaceutically acceptable non-toxic salts and a pharmaceutically acceptable carrier.

4,203,986
M-TRIFLUORO-METHYLPHENYL-PIPERAZINE

Maurice Joullié, Saint-Germain-en-Laye; Gabriel Maillard, Paris; Lucien Lakah, Paris; Christian J. M. Warolin, Paris, and Yves R. A. Pascal, Paris, all of France, assignors to Metabio-Joullie, France

Filed Jan. 13, 1978, Ser. No. 869,277
Claims priority, application United Kingdom, Jan. 14, 1977, 1539/77
Int. Cl.[2] C07D *295/08, 295/10;* A61K *31/495*
U.S. Cl. 424—250 16 Claims

1. A compound of the formula



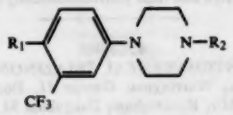
wherein

R_1 is selected from a hydrogen or fluorine atom, and

R_2 is selected from the group consisting of an alkyl group containing 2 to 6 carbon atoms and which is substituted by at most two hydroxy groups or an oxo group and also by a 4-(m-trifluoromethylphenyl)-piperazino or 4-(3-trifluoromethyl-4-fluoro-phenyl)-piperazino group,

and pharmaceutically-acceptable acid addition salts thereof.

11. A compound of the formula



wherein

R_1 is selected from the group consisting of hydrogen and fluorine, and R_2 is selected from the group consisting of

3-[4-(m-trifluoromethylphenyl)-piperazino]-2-hydroxypropyl,

3-[4-(m-trifluoromethyl-4-fluorophenyl)piperazino]-2-hydroxypropyl, and

3-[4-(m-trifluoromethylphenyl)piperazino]-2-oxo-propyl,

and pharmaceutically-acceptable acid addition salts thereof.

15. A pharmaceutical composition comprising a compound according to claim **11**, together with a pharmaceutically acceptable diluent.

4,203,987

3-[PYRIDINYLALKYL AND PIPERIDINYLALKYL]-2,3,4,4a-TETRAHYDRO-1H-PYRAZINO[1,2-a]QUINOXALIN-5(6H)-ONES

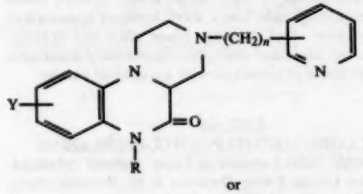
Meier E. Freed, Paoli, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 21, 1979, Ser. No. 40,609

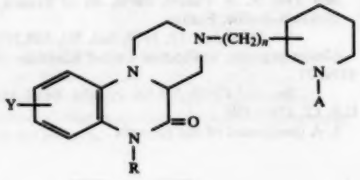
Int. Cl.[2] **A61K** *31/495;* **C07D** *487/04*

U.S. Cl. 424—250 **54 Claims**

1. A compound of the formula:



or



wherein

n is an integer from 1 to 8;

R is hydrogen or lower alkyl;

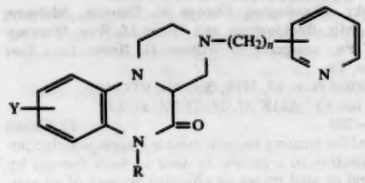
Y is hydrogen, lower alkyl, lower alkoxy, chlorine, fluorine, or trifluoromethyl, in the 7, 8, or 9 position;

A is hydrogen, lower alkyl, phen(lower)alkyl, or diphenyl(-lower)alkyl; and

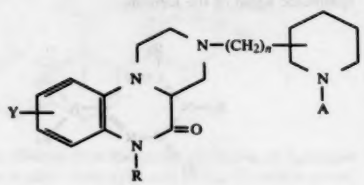
the pyridinyl or piperidinyl moiety is joined to the alkylene bridging group at the 2 or 4 position; or

a non-toxic acid addition salt thereof.

34. A method for relieving hypertension in warm-blooded animals which comprises administering to an animal in need thereof an anti-hypertensive effective amount of a compound of the formula:



or



wherein

n is an integer from 1 to 8;

R is hydrogen or lower alkyl;

Y is hydrogen, lower alkyl, lower alkoxy, chlorine, fluorine, or trifluoromethyl in the 7, 8, or 9 position;

A is hydrogen, lower alkyl, phen(lower)alkyl, or diphenyl-(lower)alkyl; and

the pyridinyl or piperidinyl moiety is joined to the alkylene bridging group at the 2 or 4 position; or

a non-toxic acid addition salt thereof.

4,203,988

PYRIDINYL UREAS AND PHARMACEUTICAL USE

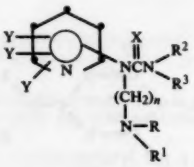
William A. Bolhofer, Frederick; Edward J. Cragoe, Jr., Lansdale, and Jacob M. Hoffman, Jr., North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 727,907, Sep. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 631,300, Nov. 12, 1975, abandoned. This application Sep. 18, 1978, Ser. No. 943,581

Int. Cl.[2] **A61K** *31/44;* **C07D** *213/75*

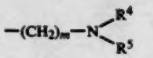
U.S. Cl. 424—266 **30 Claims**

1. A compound of the formula



wherein n is a whole number from 2 to 8 and up to 4 hydrogen atoms in the alkylene chain $(CH_2)_n$ may be replaced by alkyl of from 1 to 3 carbon atoms;

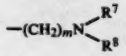
R, R^1, R^2 and R^3 are hydrogen or alkyl of from 1 to 8 carbon atoms, aralkyl wherein alkyl is 1 to 3 carbon atoms, cycloalkyl or from 3 to 7 carbon atoms in the ring, cycloalkylmethyl with from 3 to 7 carbon atoms in the ring, alkoxyalkyl wherein alkoxy is 1 to 4 carbon atoms and alkyl is 1 to 4 carbon atoms, lower alkylcarbonyloxyalkyl, hydroxyalkyl of from 1 to 4 carbon atoms, haloalkyl of from 1 to 3 carbon atoms,



wherein m is 0, 2 or 3 and R^4 and R^5 are the same or different and are

hydrogen or alkyl of from 1 to 4 carbon atoms; phenyl, substituted phenyl wherein the substituent is alkyl of from 1 to 3 carbon atoms, alkoxy of from 1 to 3 carbon atoms, halogen or haloalkyl of from 1 to 3 carbon atoms;

the Y substituents are the same or different and are hydrogen, alkyl of from 1 to 4 carbon atoms, hydroxyalkyl of from 1 to 4 carbon atoms, deuteroalkyl of from 1 to 4 carbon atoms, phenyl, hydroxy, halogen,



wherein m is 0–3 and R^7 and R^8 are the same or different and are hydrogen, alkyl of from 1 to 4 carbon atoms or aralkyl wherein alkyl is 1 to 3 carbon atoms; haloalkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, aralkoxy wherein alkoxy is 1 to 3 carbon atoms, alkylthio of from 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, cyano, nitro, formyl, loweralkoxycarbonoyl wherein alkoxy is 1 to 5 carbon atoms or carbamoyl;

X is oxygen or sulfur;

and the quaternary ammonium or N-oxide derivatives thereof, and the pharmaceutically acceptable acid-addition salts thereof.

28. A method for inhibiting gastric acid secretion which comprises administering to a mammalian species an effective amount of a compound of claim 1.

4,203,989

ANTI-DIARRHEAL DIARYL-(1-AZABICYCLO(2.2.2)OCTAN-2-YL)-ALKANOLS AND RELATED COMPOUNDS

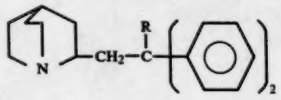
Chung H. Yen, Arlington Hts., and James R. Deason, Wilmette, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 30, 1979, Ser. No. 34,889

Int. Cl.[2] A61K *31/445;* C07D *453/02*

U.S. Cl. 424—267 **19 Claims**

10. A method of treating diarrhea comprising administering to an animal in need of anti-diarrheal treatment an effective anti-diarrheal amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein R is a cycloalkanol having 4–8 carbon atoms, an alkanol having 1–2 carbon atoms, or a radical of the formula

wherein R_1 and R_2 are each H or a C_1–C_5 alkyl, and R_3 is H or an acyl of the formula

wherein R_4 is H or a C_1–C_4 alkyl.

4,203,990

ANTI-DIARRHEAL 2-SUBSTITUTED QUINUCLIDINES

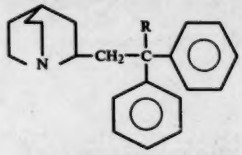
Chung H. Yen, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 30, 1979, Ser. No. 34,890

Int. Cl.[2] A61K *31/445;* C07D *453/02*

U.S. Cl. 424—267 **9 Claims**

5. A method of treating diarrhea comprising administering to an animal in need of anti-diarrheal treatment an effective anti-diarrheal amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein R is phenyl, halogen-substituted phenyl, lower alkyl-substituted phenyl, pyridyl or 5-methyl-1,3,4-oxadiazol-2-yl.

4,203,991

(PIPERIDINO OXOETHOXY)ACETIC ACID COMPOUNDS, COMPOSITIONS AND METHODS

Michael J. Umen, Glenside, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

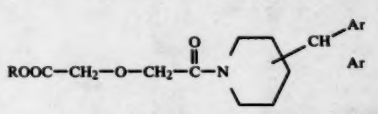
Continuation-in-part of Ser. No. 829,117, Aug. 30, 1977, Pat. No. 4,123,538. This application Sep. 1, 1978, Ser. No. 939,146

The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.

Int. Cl.[2] C07D *211/16;* A61K *31/445*

U.S. Cl. 424—267 **4 Claims**

1. A (2-amino-2-oxoethoxy)acetic acid compound represented by the formula



wherein

R is lower alkyl or phenylalkyl; and

Ar is phenyl, trifluoromethylphenyl, halo-substituted-phenyl, lower alkyl-substituted-phenyl or lower alkoxy-substituted-phenyl.

4. A method for inhibiting gastric secretion which comprises administering to a subject with gastric hyperacidity, an effective antisecretory amount of a compound of claim 1.

4,203,992

β-BROMOPENICILLANIC ACID SULFONE

Eric M. Gordon, Pennington, and William H. Koster, Ringoes, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 11, 1978, Ser. No. 968,538

Int. Cl.[2] A61K *31/43;* C07D *499/44*

U.S. Cl. 424—271 **6 Claims**

3. A method of inhibiting the action of the β-lactamase enzyme RTEM in a mammalian host being treated with a

β-lactam antibiotic susceptible to degradation by the RTEM enzyme, which comprises administering (2S,5R,6S)-6β-bromo-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, S,S-dioxide, or a physiologically acceptable salt thereof or a readily hydrolyzable ester thereof to the host in conjunction with the antibiotic.

4,203,993

6α-BROMOPENICILLANIC ACID SULFONE

Eric M. Gordon, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 11, 1978, Ser. No. 968,539
Int. Cl.[2] A61K *31/43*; C07D *499/44*
U.S. Cl. 424—271 **6 Claims**

3. A method of inhibiting the action of the β-lactamase enzyme RTEM in a mammalian host being treated with a β-lactam antibiotic susceptible to degradation by the RTEM enzyme, which comprises administering (2S,5R,6S)-6α-bromo-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, S,S-dioxide, or a physiologically acceptable salt thereof or a readily hydrolyzable ester thereof to the host in conjunction with the antibiotic.

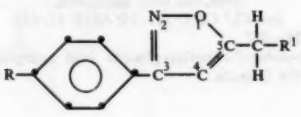
4,203,994

FUNGICIDAL 3-PHENYL-5-(SUBSTITUTED METHYL)ISOXAZOLES

James D. Davenport; Barry A. Dreikorn, both of Indianapolis, Ind., and A. Frederick Elsasser, Columbus, Ohio, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 695,669, Jun. 14, 1976, Pat. No. 4,109,002. This application May 10, 1978, Ser. No. 904,687
Int. Cl.[2] A01N *9/22, 9/28, 9/00*
U.S. Cl. 424—272 **6 Claims**

1. A fungicidal method of reducing the adverse effects of fungal foliar phytopathogens which comprises applying to the phytopathogens on the foliage of host plants an effective phytopathogen-inhibiting amount of a compound of the formula



wherein
R represents
chloro,
bromo,
fluoro,
trifluoromethyl, or
hydrogen;
R^1 represents
bromo or
chloro.

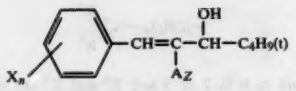
4,203,995

1-PHENYL-2-AZOLYL-4,4-DIMETHYL-1-PENTEN-3-OLS AND THE FUNGICIDAL USE THEREOF

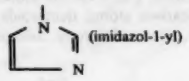
Yuji Funaki, Toyonaka; Hirofumi Oshita, Takarazuka; Shizuya Tanaka, Minoo; Shigeo Yamamoto, Ikeda, and Toshiro Kato, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 28, 1978, Ser. No. 937,384
Claims priority, application Japan, Sep. 7, 1977, 52-108166
Int. Cl.[2] A01N *9/00, 9/22*; C07D *00/00*
U.S. Cl. 424—273 R **7 Claims**

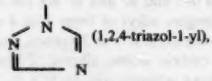
1. A compound of formula:



wherein X, which may be same or different, is alkyl (C_1–C_4), cyano, alkoxy (C_1–C_4), phenoxy, phenyl or halogen, n is zero or an integer of 1 to 2, A_Z is an imidazole group of the formula



or triazole of the formula



or salts thereof.

7. A method for killing fungi which comprises applying a fungicidally effective amount of the compound according to claim 1 to the fungi.

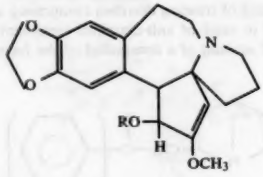
4,203,996

SYNTHETIC CEPHALOTAXINE ESTERS HAVING ANTILEUKEMIC P388 ACTIVITY

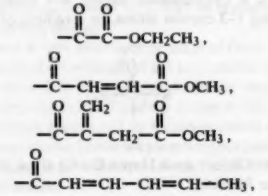
Kenneth L. Mikolajczak, Washington, and Cecil R. Smith, Jr., Dunlap, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 880,000, Feb. 22, 1978, Pat. No. 4,152,333. This application Jan. 3, 1979, Ser. No. 738
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **7 Claims**

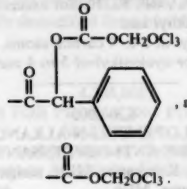
1. A method of treating animals for remission of leukemia of the strain P388 comprising administering to said animals by injection an amount, effective for said remission, of an active alkaloid compound having the following structure:



where R is selected from the group consisting of



-continued



, and

.

4,203,997

DIRECTLY-PRESSABLE ASCORBIC ACID-CONTAINING GRANULATES

Walter Küppers, Reinheim, and Pasquale Della Mura, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,362

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706660

Int. Cl.[2] A61K *31/365*

U.S. Cl. 424—280 **11 Claims**

1. In a directly pressable granulate comprising 90–93 weight % of ascorbic acid and a binder, the improvement wherein the binder consists essentially of, sorbitol, mannitol or xylitol.

4,203,998

FUNGICIDAL USE OF CHLORO-SUBSTITUTED PHENOXY ETHERS

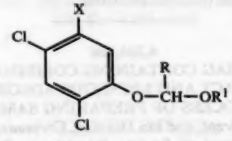
Don R. Baker, Orinda, and Malcolm B. McClellan, San Jose, both of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

Continuation of Ser. No. 50,971, Jun. 29, 1970, abandoned, and a continuation-in-part of Ser. No. 657,003, Jul. 31, 1967, abandoned, which is a continuation-in-part of Ser. No. 574,529, Aug. 24, 1966, abandoned. This application Jun. 23, 1975, Ser. No. 589,112

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—283 **3 Claims**

1. The method of controlling the growth of fungi comprising applying to the habitat of said fungi a fungistatically effective amount of a compound having the formula



wherein X is selected from the group consisting of hydrogen and chlorine, and jointly R and R^1 are a divalent alkylene radical containing 3 to 4 carbon atoms.

4,203,999

BIS(DITHIOCARBAMATE) SALTS

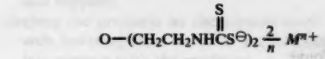
Charles W. Martin, Lake Jackson, and Eldon L. Ward, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 16, 1978, Ser. No. 951,915

Int. Cl.[2] A01N *9/12;* **C07C** *155/08;* **C07F** *15/02, 3/06*

U.S. Cl. 424—286 **8 Claims**

1. A compound of the formula



wherein

n is the valence of M and is 1, 2 or 3, and M is ammonium, an alkali metal, or a transition metal.

4,204,000

ANTI-ULCER AMIDINOUREAS

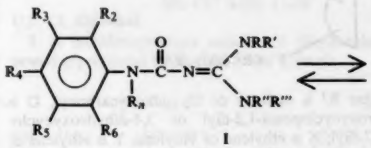
Julius Diamond, Morris Plains, N.J., and George H. Douglas, Malvern, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 787,673, Apr. 14, 1977, abandoned, which is a division of Ser. No. 558,187, Mar. 31, 1975, Pat. No. 4,060,635. This application Sep. 14, 1978, Ser. No. 942,247

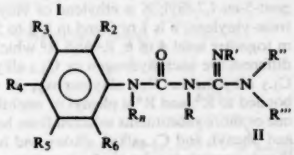
Int. Cl.[2] C07C *127/19;* **A61K** *31/17, 31/22, 31/275*

U.S. Cl. 424—304 **6 Claims**

1. A method for treating gastrointestinal hyperacidity in humans and mammals in need thereof which comprises the oral or parenteral administration of an effective amount of an amidinourea of the general formula I or its tautomeric form II when R is hydrogen:



I



II

where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are
- hydrogen,
- hydroxy,
- arloweralkoxy,
- acyloxy,
- cyano, or
- haloloweralkoxy

provided they are not all hydrogen at the same time;

R and R′ are hydrogen or loweralkyl;

R″ and R‴ are hydrogen,
- loweralkyl,
- loweralkenyl,
- cycloalkenyl up to 9 carbon atoms,
- cycloalkylloweralkyl,
- loweralkyl,
- cycloalkyl,
- aralkyl,
- loweralkynyl,
- haloalkyl,
- hydroxyalkyl,
- alkoxyalkyl,
- cyanoalkyl,
- aminoalkyl,
- mono- and di- loweralkylaminoalkyl,
- carbamoylalkyl,
- mono- and di- carbamoylalkyl,
- carboxyalkyl,
- alkoxycarbonylalkyl,
- aralkoxycarbonylalkyl,

formyl,
acyl,
acylalkyl,
alkylsulfonyl or
aralkylsulfonyl;
R'' and R''' together may form a 5–7 atom ring which may include 0–2 hetero atoms of N, O or S;
R_n is hydrogen or loweralkyl provided at least one of R, R', R'' and R''' is other than hydrogen; and
the non-toxic acid addition salts thereof.

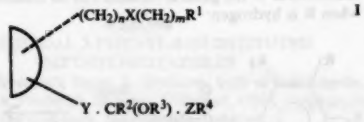
4,204,001

PROSTANE DERIVATIVES

Jean Bowler, and Graham E. Robinson, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 816,666, Jul. 18, 1977, Pat. No. 4,115,580. This application May 30, 1978, Ser. No. 910,894
Claims priority, application United Kingdom, Aug. 11, 1976, 33382/76
Int. Cl.[2] C07C *177/00*
U.S. Cl. 424—308 **9 Claims**

1. A prostane derivative of the formula:



I

wherein either R^1 is carboxy or C_{2-12}alkoxycarbonyl, D is 3,4,5-trihydroxycyclopenta-1,2-diyl or 3,4-dihydroxycyclopent-5-en-1,2-diyl; X is ethylene or vinylene; Y is ethylene or trans-vinylene; n is 1 or 2 and m is 2 to 5, provided that n and m together total 4 to 6; R^2 and R^3 which may be the same or different are each hydrogen or C_{1-4} alkyl; Z is a direct bond, C_{1-3} alkylene or C_{1-3} alkyleneoxy, in which the oxygen is bonded to R^4; and R^4 is phenyl or naphthyl optionally bearing one or more substituents selected from halogen, nitro, hydroxy and phenyl, and C_{1-4}alkyl, alkoxy and halogenoalkyl; and for those compounds wherein R^1 is carboxy, the pharmaceutically or veterinarily acceptable salts thereof.

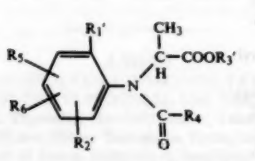
4,204,002

METHODS OF USING N-(SUBSTITUTED)-N-ALKOXY CARBONYL ANILINO COMPOUNDS

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 723,825, Sep. 16, 1976, Pat. No. 4,093,738, which is a continuation-in-part of Ser. No. 564,016, Apr. 1, 1975, abandoned. This application Mar. 13, 1978, Ser. No. 885,718
Int. Cl.[2] A61K *31/24*
U.S. Cl. 424—309 **8 Claims**

1. A method of combatting phytopathogenic fungi which consists essentially of applying to the locus thereof an effective amount of a compound of the formula Ia



Ia

wherein
R_1' represents methyl
R_2' represents methyl, ethyl or chlorine
R_5 represents hydrogen, alkyl of 1 to 3 carbon atoms or halogen and
R_6 represents hydrogen or methyl; the total number of carbon atoms in R_1', R_2', R_5, R_6 not exceeding 4;
R_3' represents methyl and
R_4 represents alkyl of 2 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms or cycloalkyl of 3 to 4 carbon atoms.

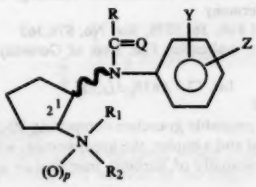
4,204,003

N-(2-AMINOCYCLOPENTYL)-N-ALKANOYLANILIDES AS CNS ANTI-DEPRESSANTS

Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 777,599, Mar. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 756,191, Nov. 30, 1976, abandoned. This application Feb. 9, 1978, Ser. No. 876,349
Int. Cl.[2] A61K *31/165*; C07C *103/20, 103/22*
U.S. Cl. 424—324 **49 Claims**

1. A process for treating depression which comprises administering to a depressed human a compound of the formula



(I)

wherein the wavy line (~) in the 1-position of the cyclopentyl ring indicates cis or trans configuration of the substituents in the 1- and 2-positions of the cyclopentyl ring;
p is zero or 1;
Q is oxygen or sulfur;
R is C_1 to C_3-alkyl;
R_1, taken separately, is hydrogen or C_1 to C_3-alkyl;
R_2, taken separately, is hydrogen or C_1 to C_3-alkyl;
each of Y and Z is selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_2-alkyl, and C_1 to C_2-alkyloxy and when Y is trifluoromethyl, Z is hydrogen; when Y is C_1 to C_2-alkyloxy and Z is hydrogen the C_1 to C_2-alkyloxy is in the 3-position; when Y and Z are both halogens or C_1 to C_2-alkyloxy they are present in the 3- and 4- or 3- and 5-positions, or a pharmacologically acceptable salt thereof, in an amount in the range from about 1 to about 100 mg per dosage unit to alleviate the conditions of depression, in association with a pharmaceutical carrier.

4,204,004

INFUSING BAG CONTAINING COMBINATION OF DRIED EXTRACT AND LIGNEOUS ADSORBENT AND PROCESS OF PREPARING SAME

David R. Farr, Brent, and Ian Horman, Corseaux, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Division of Ser. No. 842,987, Oct. 17, 1977, Pat. No. 4,160,042. This application Mar. 22, 1979, Ser. No. 22,798
Claims priority, application Switzerland, Jul. 29, 1977, 9410/77
Int. Cl.[2] A23F *1/10, 3/00*
U.S. Cl. 426—77 **10 Claims**

1. A process for treating an aqueous extract of a vegetable material to reduce its caffeine and/or chlorogenic acid content, which comprises contacting said aqueous extract containing caffeine and/or chlorogenic acid with a solid ligneous adsorbent of vegetable origin in divided form at a temperature of from 0° to 100° C. so as to adsorb caffeine and chlorogenic acid by suspending said adsorbent in said extract with stirring, drying the suspension without separation of the adsorbent by

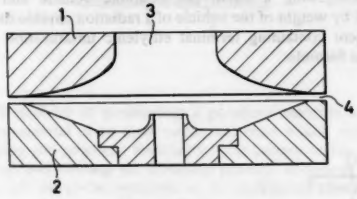
freeze-drying, introducing the dry mixture obtained into infusing bags wherein the extract is obtained in partially decaffeinated and partially deacidified form by infusing the bags in hot water.

4,204,005

PROCESS FOR PRODUCING FIBROUS FOOD MATERIALS

Shiro Kudo, Ito, and Mitsuyoshi Hayashi, Toyooka, both of Japan, assignors to Asahimatsu Koridofu Kabushiki Kaisha, Nagano, Japan

Filed Dec. 16, 1977, Ser. No. 861,564
Claims priority, application Japan, Dec. 27, 1976, 51-158359; Apr. 18, 1977, 52-44381
Int. Cl.[2] A23P *1/00*; B02C *7/02*
U.S. Cl. 426—518 **2 Claims**



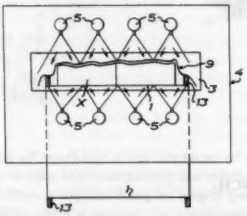
1. A process for producing fibrous or granular foods and feeds from cereal, vegetable, animal and fish materials comprising adjusting the water content of the materials to between 10–65% by weight and grinding the raw food materials between two opposing disc grinding members separated by a gap not larger than 1 mm, wherein one of the grinding members rotates at a peripheral speed from 8 to 8000 m/min, and wherein the opposing discs are concave to form a central hollow portion therebetween having an approximately trapezoidal cross section.

4,204,006

METHOD OF THERMALLY TREATING UNPACKAGED FOOD PRODUCTS

Lennart Emgard; Alan Lascelles, both of Helsingborg, and Lars Eek, Nyhamnsläge, all of Sweden, assignors to Frigoscandia Contracting AB, Helsingborg, Sweden

Continuation of Ser. No. 876,815, Feb. 10, 1978, abandoned. This application Mar. 5, 1979, Ser. No. 17,651
Claims priority, application Sweden, Feb. 18, 1977, 7701856
Int. Cl.[2] A23L *3/18*
U.S. Cl. 426—520 **4 Claims**



1. A method of thermally treating exposed, unpackaged food products, comprising the steps of

placing the products on a support in the form of a conveyor belt of high thermal conductivity;

moving as a continuous web, a thin, fluid-tight and readily flexible covering layer, which has a width greater than that of the products resting on the support, in unison with said support;

draping the products on the support under the continuous web covering layer so as to prevent fluid from coming into contact with the products;

flushing the underside of the support while simultaneously flushing under pressure the top side of the continuous web covering layer with a fluid which has a temperature different from that of the products, which fluid exchanges heat with the products by supplying heat to or removing heat from the products;

pressing the continuous web covering layer flushing under pressure its top side to move the web to closely follow the free surfaces of the products and be adjacent to portions of the support so as to maximize the area over which heat exchange with the fluid takes place;

undraping the products on the support; and then

winding the continuous web over a roller.

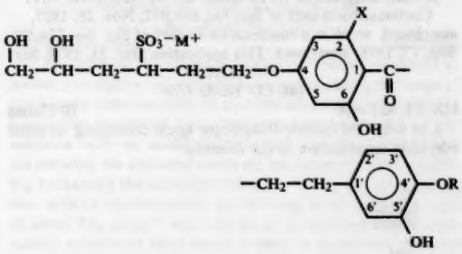
4,204,007

4-(DIHYDROXYHEXOXY)DIHYDROCHALCONE SWEETENERS

Patricia C. Wang; Robert E. Wingard, Jr., and Guy A. Crosby, all of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation-in-part of Ser. No. 863,116, Dec. 22, 1977, abandoned. This application Dec. 1, 1978, Ser. No. 964,211
Int. Cl.[2] A23L *1/236*
U.S. Cl. 426—548 **11 Claims**

1. A dihydroxyhexoxy substituted dihydrochalcone compound represented by the structural formula



wherein R is a lower alkyl of from one to three carbon atoms inclusive, X is hydrogen or hydroxy, and M^+ is a physiologically acceptable cation.

4,204,008

PREPARATION OF PROTEIN CONCENTRATES FROM WHEY AND SEED PRODUCTS

Robert M. Saunders, and George O. Kohler, both of El Cerrito, Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 839,711, Oct. 5, 1977, abandoned, and a continuation-in-part of Ser. No. 695,616, Jun. 14, 1976, Pat. No. 4,064,283. This application Dec. 28, 1978, Ser. No. 974,170
Int. Cl.[2] A23J *1/12, 1/14, 1/20*
U.S. Cl. 426—583 **4 Claims**

1. A process for preparing a protein concentrate from whey and a protein-containing seed product, said concentrate being useful as a human food supplement, which consists of

(a) mixing the whey and the protein-containing seed product,

(b) applying an alkalizer to the mixture to adjust to a pH of about 9–10,

(c) separating a juice containing soluble proteins therefrom,

(d) acidifying the juice to about pH 7, and

(e) drying the so-treated juice to obtain a solid product.

4,204,009

TWO LAYER RESIST SYSTEM

Bai-Cwo Feng, Wappingers Falls, and George C. Feng, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 865,814, Dec. 30, 1977. This application Aug. 24, 1978, Ser. No. 936,434

Int. Cl.[2] B05D *3/02, 3/06, 1/36*

U.S. Cl. 427—36 **6 Claims**

1. In a method for forming a lift-off resist mask comprising:

coating on a substrate a first layer of resist material,

coating on said first layer a second layer of resist material which is slower dissolving in resist developer than said first layer of resist material after exposure of both layers to actinic radiation each resist material being a sensitized organic polymer capable of forming a patterned resist mask to protect the underlying portions of a substrate,

exposing portions of said layers to actinic radiation and developing to remove the exposed portions of said layers to uncover said substrate by treating said layers with a solvent which preferentially dissolves the exposed portions, the improvement wherein:

said second layer is formed from a resist material solution which is saturated with a dilutant which does not substantially dissolve said first layer.

4,204,010

RADIATION CURABLE, ETHYLENICALLY UNSATURATED THIXOTROPIC AGENT AND METHOD OF PREPARATION

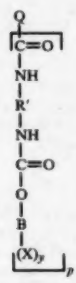
David E. Kramm, Laurel, and Arthur D. Ketley, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 855,072, Nov. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 724,196, Sep. 17, 1976, abandoned. This application Dec. 21, 1978, Ser. No. 972,127

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—44 **10 Claims**

1. A radiation curable thixotropic agent containing terminal ethylenic unsaturation of the formula:



wherein

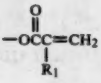
Q is the residue obtained by removal of H from primary OH groups of the reaction product from the esterification of a polyhydric alcohol containing primary OH groups with only a fatty carboxylic acid containing 4 to 26 carbon atoms in a saturated aliphatic hydrocarbon chain;

R′ is an aliphatic or aromatic polyvalent organic moiety of a polyisocyanate after reaction of the isocyanato groups;

B is an aliphatic hydrocarbon containing 1–36 carbon atoms;

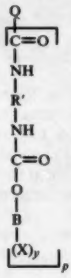
X is a member of the group consisting of

and



wherein R_1 is hydrogen or a methyl group and p and y are each integers from 1–10.

7. The process of forming a varnished printed paper product which comprises feeding the paper product to a color offset press, applying at least one UV curable colored ink in the desired design to a surface of the paper product, wet trapping the applied ink with a UV curable overprint varnish composition comprising a liquid photocurable vehicle and about 5–15% by weight of the vehicle of a radiation curable thixotropic agent containing terminal ethylenic unsaturation of the general formula:



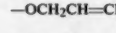
wherein

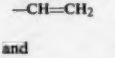
Q is the residue obtained by removal of H from primary OH groups of the reaction product from esterification of a polyhydric alcohol containing primary OH groups with only a fatty carboxylic acid containing 4 to 26 carbon atoms in a saturated aliphatic hydrocarbon chain;

R′ is an aliphatic or aromatic polyvalent organic moiety of a polyisocyanate after reaction of the isocyanate groups,

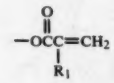
B is an aliphatic hydrocarbon containing 1–36 carbon atoms,

X is a member of the group consisting of





and



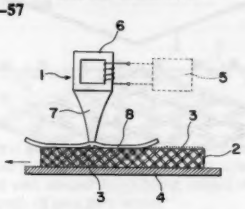
wherein R_1 is hydrogen or a methyl group and p and y are each integers from 1–10 and, thereafter, exposing the overprint varnish and ink to UV radiation for a time sufficient to simultaneously cure the ink and varnish thereby forming a glossy, hard, cured coating on the printed surface.

4,204,011

METHOD OF DRIVING POWDERY MATERIAL INTO POROUS MATERIAL OF OPEN-CELLED STRUCTURE

Naoto Tanabe, Takatsuki; Kenzoh Okada, and Norio Maeda, both of Neyagawa, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed Jun. 30, 1978, Ser. No. 921,170
Claims priority, application Japan, Jul. 4, 1977, 52/80281
Int. Cl.[2] B05D 3/12
U.S. Cl. 427—57 6 Claims



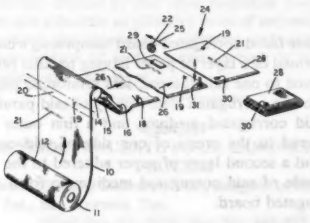
1. A method of permeating a powdery material into the porous material of an open-celled structure which comprises spreading the powdery material on one surface of the porous material, and causing the powdery material so spread to permeate into the porous material by the application of vibrations to the powdery material, which vibrations are generated by a vibration generator including a vibrating element in contact with the powdery material spread on the surface of the porous material, with the frequency and amplitude of the vibrations so selected as to minimize scattering of the powdery material, said frequency and amplitude being within the range of 50 to 50,000 Hz and within the range of 50 to 1,500 μm, respectively, to cause permeation of the powdery particles in the area of the porous material disposed within the area defined by the vibrating element.

4,204,012

SHEET INSPECTION AND MARKING SYSTEM

Charles E. Brocklehurst, and Perry E. Burton, both of Fountain Inn, S.C., assignors to Opelika Manufacturing Corp., Chicago, Ill.

Filed Nov. 1, 1978, Ser. No. 956,791
Int. Cl.[2] B05D 5/12; B05C 9/12
U.S. Cl. 427—288 14 Claims



1. A method of marking a cut segment of sheet material bearing a flaw or the like comprising the steps of moving the sheet material from a supply along its length past a cutter into a cutting station, cutting across the sheet material with the cutter to form the sheet material into cut segments of predetermined length at the cutting station, and as the sheet material is moved toward the cutting station, inspecting the sheet material for the purpose of detecting flaws in the sheet material, applying a detectable substance to the sheet material at a position adjacent a flaw in the sheet material, detecting the detectable substance as the flaw in the sheet material moves into the cutting station, and in response to the detection of the detectable substance and to the movement of a predetermined portion of the flawed segment to be cut into the cutting station marking the segment of the sheet material which bears the flaw at a location which appears at a predetermined position on the cut segment of sheet material.

9. Apparatus for marking sheet material bearing a flaw or the like comprising sheet cutting means for cutting the sheet material into segments, conveyor means for moving the uncut sheet material from a supply along its length through a path to said cutting means, first marking means positioned along the path for applying a detectable mark to the sheet material at a predetermined distance from a flaw in the sheet material, detection means positioned along the path between said first marking means and said cutting means for detecting the detectable mark on the sheet material, length measuring means for detecting the movement of the last portion of the sheet material into said cutting means prior to cutting the sheet material, second marking means positioned along the path between said detection means and said cutting means responsive to said detection means and to said length measuring means for applying a second mark to a predetermined portion of the flawed segment of the sheet material moved into said cutting means.

4,204,013

METHOD FOR TREATING POLYMERIC SUBSTRATES PRIOR TO PLATING EMPLOYING ACCELERATING COMPOSITION CONTAINING AN ALKYL AMINE

Donald A. Arcilesi, Mt. Clemens, Mich., and Warren R. Doty, Los Alamos, N. Mex., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Oct. 20, 1978, Ser. No. 953,153
Int. Cl.[2] C23C 3/02
U.S. Cl. 427—304 10 Claims

1. In a process for treating a polymeric plastic substrate to render it receptive to electroless plating including the steps of etching the substrate with an aqueous acid solution containing hexavalent chromium ions, rinsing and activating the etched substrate with an acidic tin-palladium complex, rinsing and accelerating the activated substrate, the improvement comprising contacting the activated substrate during the accelerating step with an aqueous acidic accelerating solution having a pH of about 0 to about 7 and containing an aqueous soluble compatible substituted alkyl amine present in an amount effective to complex substantially all of any contaminating cupric and ferric ions present and to extract any residual tin constituents present on the surface of the activated substrate, an anion of a mineral acid or alkali metal salts thereof present in an amount up to about 120 g/l, said substituted alkyl amine corresponding to the following structural formula:

Wherein:

R_1 is an organic radical

in which x and y=1 to 4;

R, R_2 and R_3 is H or $—(CH_2)_zX$ in which z=1 to 6 and X is —OH, $—SO_3H$, —COOH, $—NH_2$, halide, $—CH_3$, or $—OCH_3$,

as well as the alkali metal salts of the foregoing.

4,204,014

LIQUID COATING COMPOSITIONS CONTAINING LITTLE OR NO SOLVENT

Jörg Dörffel, Marl; Werner Andrejewski, Dorsten, and Wilfried Bartz, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 895,673, Apr. 12, 1978, abandoned. This application May 7, 1979, Ser. No. 36,708

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721989

Int. Cl.[2] B05D 3/02; C08L 61/20, 67/00

U.S. Cl. 427—385.5 15 Claims

1. In a liquid coating composition comprising a small amount of solvent or no solvent, a binder and optionally conventional auxiliary agents, wherein the binder consists essentially of:

(A) 45–10% by weight of an aminoplast, the low molecular weight precursors thereof, or mixtures thereof; and

(B) 55–90% by weight of an at least difunctional polyester or a mixture of such polyesters; wherein the polyester component B has been produced by the condensation of an alcohol component I with an acid component III, wherein component I consists essentially of:

I.1 0–50 molar percent of one or aliphatic polyols of 3 or 4 hydroxy groups and 3–6 carbon atoms; and

I.2 100–50 molar percent of a mixture II of aliphatic and cycloaliphatic diols wherein mixture II consists essentially of:

II.1 0–90 molar percent of ethylene glycol;

II.2 0–90 molar percent of 1,2-propanediol; and

II.3 0–40 molar percent of one or more aliphatic or cycloaliphatic diols whose hydroxy functions are separated by 2–8 carbon atoms and up to 2 carbon atoms of which can be replaced by oxygen atoms which are separated from each other and from the hydroxy groups by at least 2 carbon atoms; wherein component III consists essentially of a mixture of:

III.1 67–92 molar percent of hexahydroterephthalic acid or a lower alkyl ester thereof; and

III.2 8–33 molar percent of an aromatic dicarboxylic acid or a lower alkyl ester derivative thereof;

wherein the polyester component B has a molecular weight of 300–1,500 and wherein the binder may be obtained by the cocondensation of aminoplast component A with polyester component B, or by the cocondensation of the starting materials used for the production of aminoplast component A with polyester component B;

the improvement wherein component III.2 is terephthalic acid or a lower alkyl ester derivative thereof.

15. A method of providing a substrate with a protective coating comprising coating the substrate with a coating composition of claim 1 and baking the coated substrate at a temperature of 100°–250° C.

4,204,015

INSULATING WINDOW STRUCTURE AND METHOD OF FORMING THE SAME

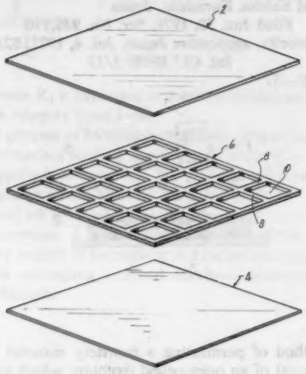
Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405, and Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437

Filed Apr. 3, 1978, Ser. No. 892,516

Int. Cl.[2] B32B 3/10; E06B 3/00

U.S. Cl. 428—34 7 Claims

1. An improved laminate for use in making thermally insulated window panes, said laminate comprising at least two gas-impermeable transparent relatively rigid panels, and at least one plastic panel sandwiched between said rigid panels, said plastic panel having opposed planar surfaces which are bonded over substantially their entire extent to respective ones of said rigid panels, said plastic panel having a multiplicity of through perforations laterally surrounded by gas impermeable strand-like portions of said plastic panel, each of said perforations being completely isolated from the others and from ambient surroundings by said rigid panels and said strand-like portions of said plastic panel, to form a multiplicity of isolated cells within the laminate, said cells being sized so that a large stock piece of said laminate can be cut in substantially any direction to form a smaller pane with retention of at least 80% of said isolated cell structure in said smaller pane whereby



thermal insulating properties of the cut pane will not be materially altered, the isolation of said cells from each other and from ambient surroundings being provided solely by said rigid panels and by said strand-like portions of said plastic panel.

4,204,016

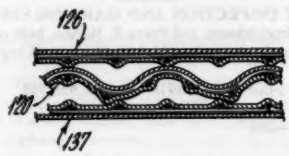
REINFORCED PAPER PRODUCTS

Marc A. Chavannes, 4044 Roberts Point, Sarasota, Fla. 33581

Division of Ser. No. 599,142, Jul. 25, 1975. This application Oct. 18, 1976, Ser. No. 733,436

Int. Cl.[2] B32B 3/28, 5/10, 5/12

U.S. Cl. 428—108 3 Claims



1. A double faced corrugated board comprising a corrugated medium formed of a layer of paper having parallel reinforcing wires adhered to one side thereof, said reinforced paper layer and wires being corrugated transversely of said parallel wires to form said corrugated medium, and a first outer layer of paper adhered to the crests of one side of said corrugated medium, and a second layer of paper adhered to the crests of the other side of said corrugated medium to form a double faced corrugated board.

4,204,017

RASTER-LIKE HEAT SEALABLE ADHESIVES ON SUBSTRATES

Josef Hefele, Gräfelfing, Fed. Rep. of Germany, assignor to Kufner Textilwerke KG, Fed. Rep. of Germany

Continuation of Ser. No. 341,961, Mar. 16, 1973, abandoned. This application Jun. 14, 1976, Ser. No. 695,814

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1972, 2214236

Int. Cl.[2] B32B 3/12, 3/26

U.S. Cl. 428—160 7 Claims

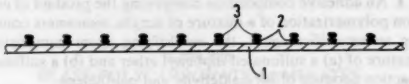
1. A flexible adhesive clothing insert structure adapted for

being heat sealed with another flexible clothing structure, comprising:

(a) a flexible clothing insert;

(b) a first raster-like layer of a heat sealable adhesive coated directly on one side of said flexible clothing insert;

(c) a second raster-like layer of a heat sealable adhesive seated substantially only on said first raster-like layer, said second raster-like layer having adhesive properties different than said first layer and a melting point lower than said first layer; and



(d) said first and second raster-like layers are of spot raster form and having at least 94 spots per square inch, isolated spots of said second layer being seated substantially only upon spots of said first layer;

whereby said flexible clothing insert retains its flexibility after heat sealing to flexible clothing structure and said heat sealable adhesive spots of the second layer are isolated from the substrate clothing insert by the spots of the first layer.

4,204,018

ACTIVATED POLYMER MATERIALS AND PROCESS FOR MAKING SAME

Bruce S. Bernstein, 46 Steele Ave., Somerville, N.J. 08876; Ramesh C. Kapoor, 113 S. Cannon St., Seaford, Del. 19973, and Seymour Hyman, 220 Central Park South, New York, N.Y. 10019

Continuation of Ser. No. 255,144, May 19, 1972, abandoned, which is a division of Ser. No. 112,053, Feb. 2, 1971, Pat. No. 3,705,938, which is a continuation-in-part of Ser. No. 593,267, Nov. 10, 1966, abandoned. This application Jul. 26, 1977, Ser. No. 819,538

Int. Cl.[2] B32B *15/08, 21/08, 27/08*

U.S. Cl. 428—246 **16 Claims**

1. A polymeric article having antistatic properties comprising

a solid, non-porous, polymeric substrate, and

a solid, non-porous layer of a polymeric composition adherently applied to at least one surface of said substrate, said composition containing at least one antistatically active agent distributed within said polymeric composition, and capable of migrating from said layer into and throughout said substrate, said agent being present in said layer in sufficient amount so that upon migration from said layer into said substrate an effective level of antistatic activity is provided throughout said substrate and on at least one other surface of said substrate which is not in direct contact with said layer.

4,204,019

POLYISOCYANURATE FOAM LAMINATE AND PROCESS

Lawrence J. Parker, Converse, Tex., assignor to Shelter Insulation, Inc., San Antonio, Tex.

Filed Sep. 11, 1978, Ser. No. 941,057

Int. Cl.[2] B32B *3/26, 5/20, 31/14*

U.S. Cl. 428—310 **12 Claims**

1. In a process for producing a polyisocyanurate foam laminate comprising mixing polyisocyanate, surfactant, blowing agent, polyol and isocyanate trimerization catalyst components to form a reaction mixture, feeding said reaction mixture between two flexible sheet substrates defining a reaction zone, and reacting and foaming said mixture to form together with said substrates said polyisocyanurate foam laminate, the improvement which comprises:

conducting said reaction at a temperature less than about 140° F.

2. The process of claim 1 comprising, in addition, the steps of sensing the pressure exerted by the reaction mixture on at least one of said substrates as the foam is formed, and controlling the feeding of said reaction mixture to said reaction zone to maintain a substantially constant pressure therein during said reaction.

7. The process of claim 2 wherein said components are

(i) a polymethylene polyphenylisocyanate;

(ii) a silicon-containing polymeric surfactant free of hydroxyl groups; and

(iii) a liquid blowing agent having a boiling point less than about 140° F.

(iv) a diol having a molecular weight less than about 150;

(v) a polyol having at least 3 hydroxyl groups;

(vi) a polyethylene glycol having a molecular weight of at least 150;

(vii) an amine salt;

(viii) a metal carboxylate; and

(ix) a dimethyl aminomethyl-substituted phenol,

wherein the reaction temperature is from about 60° F. to less than about 140° F.

11. The laminate produced by the process of claim 7.

4,204,020

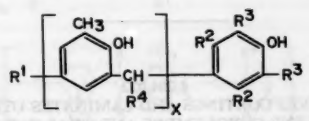
PHENOLIC FOAM LAMINATED STRUCTURAL PANEL

John H. Beale, Dedham, Mass., and Ernest K. Moss, St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Continuation of Ser. No. 837,875, Sep. 29, 1977, Pat. No. 4,140,842. This application Aug. 22, 1978, Ser. No. 935,846

Int. Cl.[2] C08J *9/14*

U.S. Cl. 428—310 **13 Claims**



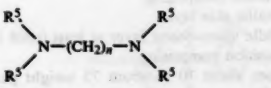
1. A laminated structural panel having at least one facing sheet and having a closed cell foam material adhering to the facing sheet wherein the closed cell foam material comprises the reaction product of:

A. phenolic-resin foam forming reactants,

B. a blowing agent,

C. a surfactant which is the capped reaction product of:

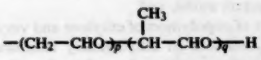
I. an alkoxylated amine of Formula VI



(VI)

wherein:

(a) R^5 is an alkoxylated chain of Formula VII, having terminal hydroxyl groups,



(VII)

(b) n is an integer from 2 to 10 inclusive,

(c) the ratio p:q is 15:85 to 85:15 with

II. a copolymerizable mixture of dialkyl maleate and a member selected from the group consisting of N-vinyl-2-pyrrolidone and N-vinyl caprolactam, and

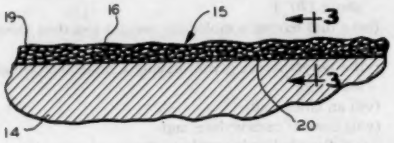
III. a capping agent for the terminal hydroxyl groups.

4,204,021

ARTICLE OF MANUFACTURE HAVING COMPOSITE LAYER AFFORDING ABRASION RESISTANT AND RELEASE PROPERTIES

Gordon P. Becker, Broadview Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Dec. 26, 1978, Ser. No. 972,708
Int. Cl.[2] B32B *27/00, 9/06, 15/04;* B05D *1/36*
U.S. Cl. 428—325 22 Claims



1. A substrate having a composite layer adhered thereto providing improved abrasion-resistant and release properties, said composite layer comprising a porous ceramic body having a continuous, communicating pore structure, and a film-forming, polymerized, organic resinous impregnant filling pores of said body selected from the group consisting of silicone polymers, polyphenyl sulfide, and fluorinated polyalkylenes, said impregnant being adapted to serve as a release agent, and said composite layer having at least the abrasion resistance of the ceramic and the release properties of the impregnant.

4. The substrate and composite layer of claim 1 in which said ceramic body comprises ceramic particles bound one to another by glass, said glass also adhering the resulting ceramic body to said substrate.

4,204,022

ADHESIVES COATINGS AND LAMINATES UTILIZING ETHYLENE COPOLYMERS AND COAL-TAR PITCH

George F. Snyder, Franklin Township, Westmoreland County, and Robert M. Stewart, Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 438,141, Jan. 30, 1974, Pat. No. 3,967,651, which is a division of Ser. No. 201,861, Nov. 24, 1971, Pat. No. 3,814,712, which is a continuation-in-part of Ser. No. 692,295, Dec. 21, 1967, abandoned. This application Mar. 23, 1976, Ser. No. 669,533
Int. Cl.[2] B32B *11/08, 15/08, 27/30*
U.S. Cl. 428—337 5 Claims

1. A laminate comprising
A. a metallic skin layer
B. a middle visco-elastic layer at least 0.008 inch thick of a composition comprising
(a) from about 10 to about 75 weight percent coal tar pitch;
(b) from about 25 to about 90 weight percent of a polymeric ethylene composition selected from
1. a terpolymer of ethylene, vinyl acetate, and an ethylenically unsaturated carboxylic acid containing from 3 to 8 carbon atoms, and
2. a mixture of copolymers of ethylene and vinyl acetate and ethylene and an ethylenically unsaturated carboxylic acid containing from 3 to 8 carbon atoms wherein the ethylene vinyl acetate copolymer and the ethylene carboxylic acid copolymer each comprise from about 5 to about 85 weight percent of the total composition, and
C. a bottom metallic constraining layer at least 0.009 inches thick.

4,204,023

MIXED SULFONATED EMULSIFYING AGENTS USED TO PRODUCE ADHESIVE COMPOSITIONS FROM ACRYLIC MONOMERS AND ADHESIVE TAPE USING THE COMPOSITIONS

Edward Witt, Framingham, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 7, 1978, Ser. No. 922,553
Int. Cl.[2] C09J *7/02*
U.S. Cl. 428—355 13 Claims

1. An adhesive composition comprising the product of emulsion polymerization of a mixture of acrylic monomers containing an emulsifier agent, the emulsifying agent comprising a mixture of (a) a sulfonated diphenyl ether and (b) a sulfonated reaction product of formaldehyde and napthalene.

6. A pressure sensitive adhesive tape comprising a substrate having an adhesive composition deposited on at least one surface thereof, the adhesive composition comprising the product of emulsion polymerization of acrylic monomers in an aqueous system containing an emulsifier agent, the emulsifying agent comprising a mixture of (a) a sulfonated diphenyl ether and (b) a sulfonated reaction product of formaldehyde and naphthalene.

13. A process for the emulsion polymerization of acrylic monomers in an aqueous system comprising: charging to a reactor, a first portion of a monomer mixture comprising 2-ethylhexylacrylate, ethyl acrylate, acrylonitrile, and acrylic acid, water and a first portion of an emulsifying agent comprising a mixture of (a) a sulfonated diphenyl ether and (b) a sulfonated reaction product of formaldehyde and naphthalene; initiating polymerization by adding to the reactor a catalyst comprising an alkali metal persulfate and an alkali metal bisulfite; adding the remaining portions of the monomer mixture and emulsifying agent in equal portions to complete the polymerization reaction.

4,204,024

ELECTRICAL INSULATION COMPOSITION HAVING LOW POWER FACTOR

Richard T. Pye, Middlebury, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Jun. 15, 1978, Ser. No. 915,900
Int. Cl.[2] C08K *3/22, 5/14;* H01B *3/00*
U.S. Cl. 428—379 12 Claims

1. An elastomeric dielectric composition with very low dielectric loss factor which consists essentially of 100 parts by weight of an ethylene-propylene elastomer, from 0.25 to 1 part by weight of a vinyl silane, from 0.1 to 2 parts by weight of lead peroxide, up to 40 parts by weight of zinc oxide, from about 1.5 to 4 parts by weight of a peroxide curing agent and an effective amount of inhibitor for said peroxide curing agent, said zinc oxide being the sole filler in said composition.

4,204,025

GLASS-POLYCARBONATE LAMINATE

Donald G. LeGrand, Burnt Hills, N.Y., and Gina G. Vitale, Arlington, Va., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 21, 1978, Ser. No. 962,614
Int. Cl.[2] B32B *17/10, 27/08, 27/30*
U.S. Cl. 428—409 7 Claims

1. An improved laminate of glass and polycarbonate resin bonded by means of a first organopolysiloxane-polycarbonate copolymer adhesive layer disposed between the glass layer and the polycarbonate layer, the improvement comprising a second polyvinylidene chloride adhesion promoting layer disposed between said first adhesive layer and said glass layer.

7. A process for forming a polycarbonate-glass laminate comprising the steps of (i) applying composition comprised of a polyvinylidene chloride emulsion to a glass lamina; (ii) evaporating off the water from said emulsion thereby forming a primer layer on said glass lamina; and, (iii) adhesively bonding

the primed glass lamina to a polycarbonate lamina with an adhesive which comprises an organopolysiloxane-polycarbonate block copolymer.

4,204,026

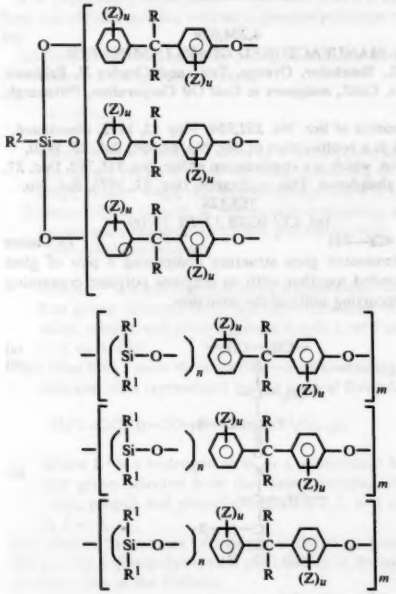
GLASS-POLYCARBONATE LAMINATES

Donald G. Le Grand, Burnt Hills, N.Y., and Gina G. Vitale, Arlington, Va., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 21, 1978, Ser. No. 962,624
Int. Cl.[2] B32B *17/10, 27/08*
U.S. Cl. 428—409 8 Claims

1. An improved laminate of glass and polycarbonate resin wherein the glass and polycarbonate resin layers are bonded together by means of an organopolysiloxane-polycarbonate copolymer adhesive layer disposed between said glass and said polycarbonate resin, the improvement comprising an adhesion promoting primer layer disposed between said glass and said organopolysiloxane-polycarbonate adhesive layer, said adhesion promoting primer layer comprising an aminoalkyl(-poly(aryloxysiloxane)) represented by the general formula

(VI)



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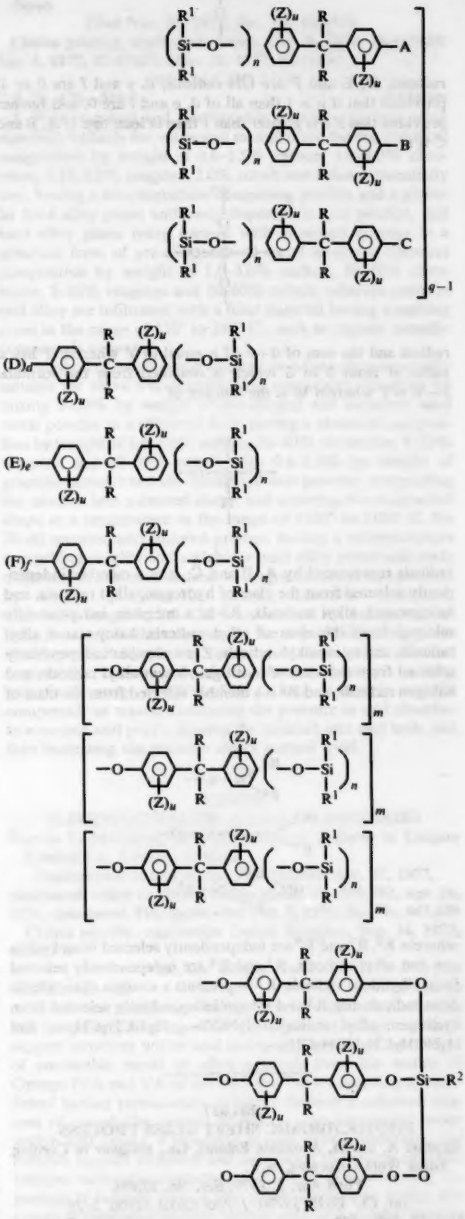
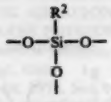
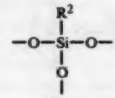


wherein u is an integer equal to from 1 to 4; n has a value of from 5 to about 500, q has a value of from 1 to about 500; m has a value of from 0 to 10; A, B and C are independently selected from OH and

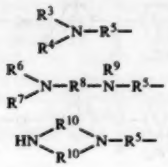


radicals; D, E and F are OH radicals, d, e and f are 0 or 1, provided that if q is 1 then all of d, e and f are 0, and further provided that if q is greater than 1 then at least one 1/f A, B and C is a

radical and the sum of d+e+f is equal to Y wherein Y has a value of from 0 to 2 which is obtained from the formula 3−W=Y wherein W is the number of



radicals represented by A, B and C; R is a member independently selected from the class of hydrogen, alkyl radicals, and halogenated alkyl radicals; R^1 is a member independently selected from the class of alkyl radicals, halogenated alkyl radicals, and cyanoalkyl radicals; Z is a member independently selected from the class of hydrogen, lower alkyl radicals, and halogen radicals; and R^2 is a member selected from the class of



wherein R^6, R^7 and R^9 are independently selected from hydrogen and alkyl radicals, R^5 and R^8 are independently selected from alkylidene radicals, R^{10} represents a straight chain alkylidene radical, and R^3 and R^4 are independently selected from hydrogen, alkyl radicals, H_2NCO-, $H_2NCH_2CH_2-$, and $H_2NCH_2CH_2NCH_2CH_2-$.

4,204,027

PHOTOCHROMIC SHEET GLASS PROCESS

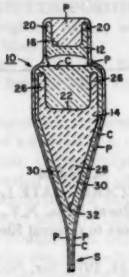
Raphael A. Simon, Avondale Estates, Ga., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 5, 1979, Ser. No. 27,498

Int. Cl.[2] B32B *33/00, 17/06;* **C03B** *17/00, 5/26*

U.S. Cl. 428—428 **9 Claims**

7. A laminated photochromic glass article comprising a central core portion of a non-photochromic glass composition and a layer of photochromic glass formed integrally with outer surfaces of said core glass, said photochromic glass being sensitized and having a sensitizing temperature above its softening point temperature, and said core glass having a softening



point temperature higher than the softening point temperature of said photochromic glass.

4,204,028

CONDUCTIVE METAL OXIDE FILM FOR SOLAR ENERGY CONTROL

Harold E. Donley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 16, 1978, Ser. No. 887,384

Int. Cl.[2] B32B *17/06*

U.S. Cl. 428—432 **4 Claims**

1. An electroconductive article comprising:

a. a glass substrate; and

b. an electroconductive metal oxide coating wherein the metal portion consists essentially of

(1) about 5 to 50 percent nickel; and

(2) about 50 to 95 percent cobalt

wherein the surface resistivity of the coated surface is less than 10^4 ohms per square.

4,204,029

MANUFACTURED GLASS LAMINATES

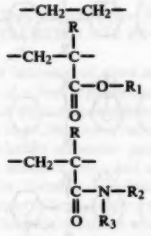
Robert L. Batchelor, Orange, Tex., and Charles F. Feldman, Fresno, Calif., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 252,934, May 12, 1972, abandoned, which is a continuation of Ser. No. 64,056, Jul. 23, 1970, abandoned, which is a continuation of Ser. No. 516,752, Dec. 27, 1965, abandoned. This application Dec. 22, 1976, Ser. No. 753,124

Int. Cl.[2] B32B *17/10, 31/00*

U.S. Cl. 428—441 **13 Claims**

1. A laminated glass structure comprising a pair of glass sheets bonded together with an ethylene polymer containing therein recurring units of the structure

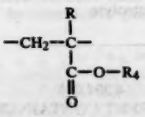


(a)

(b)

(c)

and optionally units of the structure



(d)

wherein R is selected from the group consisting of hydrogen and alkyl groups, R_1 is hydrogen, R_2 and R_3 are hydrogen, and R_4 is an alkyl group, the combined total of said units of the formulae (b), (c) and (d) being present in a ratio from about 0.025 to about 0.25 mole per mole of unit (a); said units (b) constituting at least 10 mole % of the total of units (b), (c) and (d); said ethylene polymer being further characterized in having the units (a), (b), (c) and (d) substantially uniformly distributed throughout the polymer chains.

4,204,030

ORGANOPOLYSILOXANE SIZED PAPERBOARDS FOR GYPSUM WALLBOARDS

Minoru Takamizawa; Akira Abe; Yoshiaki Ono; Yutaka Sugimori, all of Annaka; Tetsuo Kishibayashi, Urawa, and Makoto Ino, Toride, all of Japan, assignors to Shin-Etsu Chemical Co. Ltd. and Yoshino Gypsum Co. Ltd., both of Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,191

Claims priority, application Japan, Oct. 5, 1976, 51-119566

Int. Cl.[2] B32B 9/04

U.S. Cl. 428—447 **10 Claims**

1. A paperboard for a gypsum wallboard which is sized at at least one of both surfaces with an organopolysiloxane comprising

(a) from 99.95 to 85 mole % of organosiloxane units represented by the general formula

$$R^1_aSiO_{(4-a)/2}$$

where R^1 is a hydrogen atom or a monovalent hydrocarbon group selected from the class consisting of methyl, ethyl, propyl, vinyl, and phenyl groups and a is 1, 2, or 3,

(b) from 0.05 to 10 mole % of mercapto-containing organosiloxane units represented by the general formula

$$HS—CH_2)_pSiR^2_bO_{(3-b)/2}$$

where R^2 is a hydrogen atom or a monovalent hydrocarbon group selected from the class consisting of methyl, ethyl, propyl, and phenyl groups, b is 0, 1, or 2 and p is 1, 2, 3, or 4, and

(c) from 0 to 5 mole % of methacryloxy-containing organosiloxane units represented by the general formula

$$H_2C{=}C(CH_3)—CO—O—CH_2)_qSiR^3_cO_{(3-c)/2}$$

where R^3 is a hydrogen atom or a monovalent hydrocarbon group selected from the class consisting of methyl, ethyl, propyl, and phenyl groups, c is 0, 1, or 2 and q is 1, 2, 3 or 4,

and wherein the amount of sizing is in the range from 15 g to 200 g of the organopolysiloxane per 1,000 kg of the paperboard on either one of the surfaces.

4,204,031

IRON-BASE SINTERED ALLOY FOR VALVE SEAT AND ITS MANUFACTURE

Kazutoshi Takemura; Takashi Oda, and Fumio Kiyota, all of Kashiwazaki, Japan, assignors to Riken Corporation, Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 855,964

Claims priority, application Japan, Dec. 6, 1976, 51-145662; Apr. 4, 1977, 52-37637; Mar. 28, 1977, 52-33284

Int. Cl.[2] C22C 1/10

U.S. Cl. 428—539.5 **8 Claims**

1. Wear resistant and machineable sintered iron-base alloy especially suitable for valve seat manufacture having chemical composition by weight of 0.6–1.5% carbon, 1.0–8.0% chromium, 0.25–4.0% tungsten, 2.0% cobalt and balance essentially iron, having a microstructure comprising pearlite and a globular hard alloy phase uniformly dispersed in said pearlite, said hard alloy phase being formed with atomized powder in a spherical form of pre-alloyed hard metal having a chemical composition by weight of 1.0–3.0% carbon, 20–40% chromium, 5–20% tungsten and 40–60% cobalt, wherein pores in said alloy are infiltrated with a filler material having a melting point in the range of 120° to 250° C., such as organic metallic compounds or waxes.

4. Method of producing a sintered iron-base alloy especially suitable for valve seat manufacture, comprising the steps of: mixing 5–20% by weight of pre-alloyed and atomized hard metal powder in a spherical form having a chemical composition by weight of 1.0–3.0% carbon, 20–40% chromium, 5–20% tungsten and 40–60% cobalt with 0.6–1.5% by weight of graphite powder and the remainder iron powder; compacting the mixture into a desired shape; and sintering the compacted shape at a temperature in the range of 1100° to 1180° C. for 30–60 minutes, said sintered product having a microstructure comprising pearlite and a globular hard alloy phase uniformly dispersed in said pearlite and having a chemical composition by weight of 0.6–1.5% carbon, 1.0–8.0% chromium, 0.25–4.0% tungsten, 2.0–12.0% cobalt and the balance essentially iron and, further comprising the step of infiltrating pores in the product by placing the product in a sealed chamber containing a molten bath of filler material having a melting point in the range of 120° to 250° C. such as organic metallic compounds or waxes, decreasing the pressure in said chamber to evacuate said pores, dipping the product into said bath, and then increasing the pressure above normal level.

4,204,032

ELECTRO-CHEMICAL CELLS OR BATTERIES

Patrick E. McKellen, Bramhall, England, assignor to Unigate Limited Co., London, England

Continuation-in-part of Ser. No. 791,444, Apr. 27, 1977, abandoned, which is a continuation of Ser. No. 500,782, Apr. 26, 1974, abandoned. This application Dec. 7, 1978, Ser. No. 967,459

Claims priority, application United Kingdom, Sep. 14, 1973, 43368/73

Int. Cl.[2] H01M 12/06

U.S. Cl. 429—13 **10 Claims**

1. A rechargeable zinc halogen electric current producing cell comprising a casing, at least one gaseous halogen cathode support structure within said casing and formed of a substrate of anodizable metal or alloy selected from the metals of Groups IVA and VA of the Periodic Table according to Mendeleef having permanently mounted thereon a coherent stratum of crumb-like porous carbon, a zinc containing anode within said casing, a separator in said casing separating said cathode support structure and said anode to prevent cathodic halogen molecules contacting said anode but permitting the passage of halogen ions, a zinc halide electrolyte within said casing in substantial surface contact with said gaseous halogen in said cathode support structure and with said anode, the internal casing temperature and pressure being such as to maintain said halogen in a gaseous state with a minimum temperature within said casing of 2° C. and a pressure of between

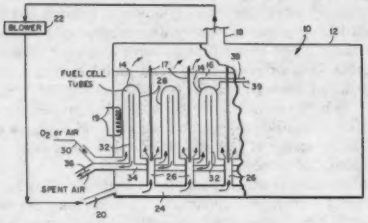
2 to 10 atmospheres, and a halogen circuit including means for storing said gaseous halogen liberated at said cathode support structure on recharge and means to supply gaseous halogen to said cathode support structure on discharge.

4,204,033

ELECTRICAL CELL CONSTRUCTION

Herman P. Meissner, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 2, 1979, Ser. No. 330
Int. Cl.² H01M 8/12
U.S. Cl. 429—33 **7 Claims**



1. An electrical cell which comprises

(a.) at least one bed of iron particles including particles at different oxidation states,

(b.) at least one fuel cell comprising a cathode adjacent one of said beds, an anode which does not contact said bed and a solid electrolyte positioned between said anode and said cathode,

(c.) said electrolyte being capable of transporting oxygen ion,

(d.) means for cycling a gas through said bed to control the temperature of said bed, and

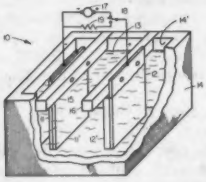
(e.) means for passing a gas in contact with said anode to promote oxygen ion transfer through said electrolyte.

4,204,034

ELECTROCHEMICAL CELL

Glenn R. Schaer, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Oct. 2, 1978, Ser. No. 947,649
Int. Cl.² H01M 2/12
U.S. Cl. 429—54 **12 Claims**



1. A rechargeable electrochemical cell comprising

a negative electrode having an active surface comprising essentially copper;

a positive electrode having an active surface comprising essentially lead dioxide, spaced from the negative electrode;

an aqueous acid electrolyte comprising essentially fluoboric, fluosilicic, sulfamic, or perchloric acid, in which both divalent copper and divalent lead ions are soluble during discharging, and from which smooth and adherent deposits may be obtained during charging, in contact with the electrodes; and

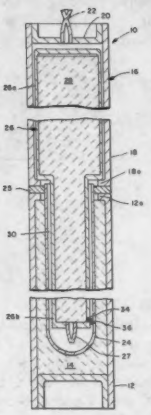
a container for the electrolyte and the electrodes, having an electrically nonconductive inner surface that is chemically resistant to the electrolyte.

4,204,035

SODIUM INSERT CONTAINER FOR A SODIUM-SULFUR CELL AND ITS METHOD OF USE

Randall N. King, Johnstown, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 25, 1978, Ser. No. 945,623
Int. Cl.² H01M 10/39
U.S. Cl. 429—104 **8 Claims**



1. In an improved sodium sulfur cell including means forming a sulfur compartment, means forming a sodium compartment including a main compartment connected to a hollow solid electrolyte separator tube with a closed end extending into said sulfur compartment means, the improvement comprising a reservoir insert container for sodium disposed within said sodium compartment forming means and including a closed-end hollow tubular portion extending into said separator tube, said reservoir tubular portion being spaced apart from said separator tube so that a chamber is formed therebetween, means forming a port permitting flow of molten sodium from the interior of said reservoir insert container into said chamber at an elevated temperature at which molten sodium is formed, said port forming means comprising an opening in said reservoir insert container sealed by a meltable plug which is solid at room temperature and which melts at the temperature of cell operation.

4,204,036

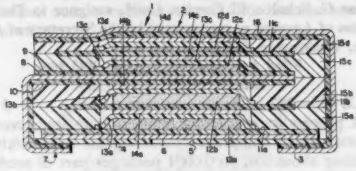
MULTIPLE DUTY BATTERY

Frederic S. Cohen, Lexington, and Albert L. Hyland, Wayland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 29, 1979, Ser. No. 25,087
Int. Cl.² H01M 6/46
U.S. Cl. 429—152 **16 Claims**

1. A laminar multiple duty battery, comprising a stack of series connected cells extending between a first outer terminal and a second outer terminal and comprising at least one intercell terminal assembly connecting a pair of adjacent cells in said stack, each intercell terminal assembly comprising a conductive metal element formed with a tab projecting from the battery for connection to external circuitry, each said metal

element being covered on both sides at least in the region within the battery by conductive plastic current collectors



extending over at least the active cell regions of the contiguous cells.

4,204,037

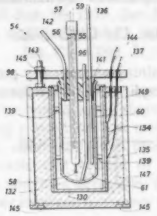
METHOD AND AUTOMATED APPARATUS FOR DETECTING COLIFORM ORGANISMS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; W. Preston Dill, Houston, Tex.; Rueben E. Taylor, Seabrook, Tex., and Eldon L. Jeffers, La Porte, Tex.

Filed Apr. 4, 1978, Ser. No. 893,657

Int. Cl.[2] C12Q *3/00, 1/06;* C12M *1/36*

U.S. Cl. 435—3 **11 Claims**



1. A method of continuous determination of the concentration of bacteria contained in a selected fluid, comprising the steps of:

providing a liquid growth medium at selected intervals,

controlling the environment of said liquid growth medium by maintaining the temperature of said medium at a first preselected temperature of 85° C. for a preselected heat-soak time period of approximately 30 minutes,

inoculating said liquid growth medium with a predetermined quantity of the selected fluid containing the bacteria,

culturing the bacteria contained in said selected fluid in said liquid growth medium for evolving hydrogen metabolically produced by the growth of the bacteria by maintaining the temperature of said inoculated growth medium at a second preselected temperature of either 35° C. or 44.5° C.,

detecting a change in potential between a measuring electrode and a reference electrode in contact with said bacteria and liquid growth medium as a result of said evolving hydrogen,

generating an electrical signal representative of said change in potential,

measuring the period of time between said inoculating of said of said liquid growth medium with the bacteria and said detecting a change in potential between said electrodes,

determining the concentration of the bacteria in said inoculated liquid growth medium as a function of said measured period of time,

discharging said liquid growth medium containing said cultured bacteria subsequent to said measuring and determining steps, initiating a cleaning and steriling cycle for removing bacterial residue remaining after discharging said liquid growth medium containing said cultured bacteria, and re-initiating said above steps beginning with providing a liquid growth medium.

4,204,038

PROCESS FOR PREPARING ANTIBIOTICS MA 144-M_1 AND MA 144-M_2

Hamao Umezawa; Tomio Takeuchi; Hiroshi Naganawa; Masaaki Ishizuka, all of Tokyo; Norio Shibamoto, Kanagawaken; Toshikazu Oki, Kanagawaken, and Taiji Inui, Kanagawaken, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 780,730, Mar. 24, 1977, Pat. No. 4,144,329. This application Feb. 21, 1978, Ser. No. 879,536

Claims priority, application Japan, Apr. 7, 1976, 51/39688

Int. Cl.[2] C12P *19/56*

U.S. Cl. 435—78 **6 Claims**

1. The process for producing the anthracycline glycoside MA 144-M_1 which comprises culturing a MA 144-M_1-producing strain belonging to the genus Streptomyces under submerged aerobic conditions in a nutrient medium containing a carbon source and a nitrogenous nutrient until a substantial amount of MA 144-M_1 is produced by said organism in said nutrient medium and recovering the MA 144-M_1 from the nutrient medium substantially free of substances co-produced therewith.

4,204,039

PROCESS FOR PRODUCING DEOXYNARASIN ANTIBIOTICS

Walter M. Nakatsukasa; Gary G. Marconi; Norbert Neuss, all of Indianapolis, and Robert L. Hamill, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 844,087, Oct. 20, 1977, Pat. No. 4,141,907. This application Jun. 19, 1978, Ser. No. 917,036

Int. Cl.[2] C12P *17/16;* C12R *1/485*

U.S. Cl. 435—118 **5 Claims**

1. The method of producing the deoxynarasin antibiotic complex which comprises cultivating *Streptomyces aureofaciens* NRRL 1181 or a deoxynarasin-producing mutant thereof in a culture medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antiobiotic activity is produced.

4,204,040

COPOLYMERIZATION OF PROTEINS ON AN INORGANIC SUPPORT

Melvin H. Keyes, Sylvania, Ohio, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Nov. 18, 1977, Ser. No. 852,635

The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

Int. Cl.[2] C07G *7/02*

U.S. Cl. 435—176 **17 Claims**

1. A process for the immobilization of proteins having a relatively low cystine and cysteine content on a support to form a biologically active protein-support composite, in the absence of a cross-linking agent, consisting essentially of the steps of:

selecting a first protein having a sum total of two times the number of the cystine amino acid residues plus al the cysteine amino acid residues equaling at least about 14 per mole of said protein;

selecting at least a second protein, which comprises an enzyme, having a sum total of two times the number of the cystine amino acid residues plus all of the cysteine amino acid residues equaling less than 14 per mole of said protein;

depositing said selected proteins on an inert support; and

copolymerizing said first and second proteins on said inert support in the absence of a cross-linking agent to provide

a protein-support composite containing an amount of enzyme comprising said protein to result in the composite having at least 1×10^{-4} enzyme units of activity per cubic centimeter of said composite.

4,204,041

HIGH LOADING OF IMMOBILIZED ENZYMES ON ACTIVATED CARBON SUPPORTS

James E. Bailey, Houston, Tex., and Yong K. Cho, Rockford, Ill., assignors to Illinois Water Treatment Company, Rockford, Ill.

Filed Oct. 3, 1977, Ser. No. 838,544
Int. Cl.[2] C07G 7/02
U.S. Cl. 435—177 4 Claims

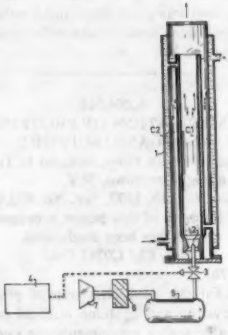
1. Method of immobilizing enzymes on activated carbon supports which comprises treating said activated carbon with a solution of a water-soluble carbodiimide which forms a complex with reactive groups on the surface of said activated carbon thereafter treating said activated carbon complex with a solution of an enzyme, whereby the enzyme displaces said carbodiimide and forms a carbon-enzyme complex, and separating said carbon-enzyme complex from the reaction media.

4,204,042

METHOD OF GASIFYING AND AGITATING A FERMENTATION CULTURE

René Chelle, Toulouse, France, assignor to Societe Anonyme S.E.T.R.I.C., Toulouse, France

Filed Feb. 9, 1978, Ser. No. 876,545
Claims priority, application France, Feb. 23, 1977, 77 05872
Int. Cl.[2] C12N 1/20
U.S. Cl. 435—253 7 Claims



1. A method of gasifying and agitating a micro-organism culture to enable the growth of the culture to be accelerated, said culture being contained in a fermenter comprising at least two containers in communication with one another in their upper and lower regions, the method comprising injecting air in the form of bubbles at the base of one of the containers during injection periods of predetermined length, and stopping the air injection for establishing non-injection periods at a predetermined frequency alternating with said injection periods, so as to produce in the two containers a surging or pulsating effect on the culture and permit a general flow between the two containers.

4,204,043

METHOD OF REMOVING PIGMENT FROM ANNATTO SEED

William G. Schultz, El Cerrito, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 4, 1978, Ser. No. 893,366
Int. Cl.[2] A23L 1/27, 1/28
U.S. Cl. 435—267 9 Claims

1. A process for extracting pigment from seeds containing the same, which comprises contacting the seeds with water containing about 0.01 to 0.0001 parts per part of seeds of an alpha-enzyme selected from the group consisting of polygalacturonases, pectinases, alpha-amylases, pectic acid transeliminases, and pectin transeliminases for a period of time of about 1–20 hours and at a temperature of about 10°–70° C. and a pH of about 3.75–7.5.

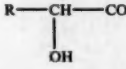
4,204,044

PROCESS FOR THE MANUFACTURE OF OPTICALLY ACTIVE α-HYDROXYCARBOXYLIC ACIDS

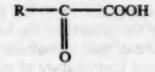
Yasuji Suhara; Hiromi Maruyama, both of Yokohama; Toyoaki Sawada, Zushi; Mayumi Ogawa, Kamakura; Kazuteru Yokose, Urayasu; Morio Fujiu, Tokyo, and Kimihiro Watanabe, Ayase, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 19, 1978, Ser. No. 926,592
Claims priority, application Switzerland, Jul. 26, 1977, 9218/77
Int. Cl.[2] C12D 1/02
U.S. Cl. 435—280 9 Claims

1. A process of obtaining an optically pure enantiomer of a D,L-α-hydroxy carboxylic acid of the formula:



wherein R is a alkyl group containing from 1 to 13 carbon atoms or pyridine
or salts thereof
comprising enzymatically treating said D,L-α-hydroxy carboxylic acid in a fermentation medium with a microorganism belonging to the genus Streptomyces, Pseudomonas or Bacillus or to the Coryneform group which microorganism has enantiospecific dehydrogenase activity to selectively dehydrogenate only one of said enantiomers to an α-keto acid of the formula:



wherein R is as above,
or salt thereof,
to leave the other of said enantiomers free of said enantiomer which was selectively dehydrogenated.

4,204,045

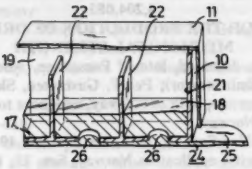
DEVICE FOR EXAMINING MICROORGANISMS

Jan O. Kjellander, and Dan G. Danielsson, both of Örebro, Sweden, assignors to Orion-Yhtyma Oy, Finland

Filed Feb. 15, 1978, Ser. No. 877,894
Int. Cl.[2] C12M 1/20; C12Q 1/20
U.S. Cl. 435—301 1 Claim

1. A device for investigating the effect of biologically active substances against microorganisms and capable of diffusing through a gel layer having microorganisms thereon, said device comprising:
a vessel having a bottom and a plurality of walls upstanding

from the bottom to define a plurality of mutually adjacent elongate rectangular compartments and a common compartment, each of said rectangular compartments having an open end to communicate it with the common compartment;



means defining a plurality of openings through said bottom into said rectangular compartments at positions spaced from said open ends of said compartments;

a removeable protective strip covering said openings and having a plurality of projections positioned to be received in said openings.

4,204,046

PRESSURE SENSITIVE ADHESIVE COMPOSITION

Shobu Minatono; Hideo Takamatsu; Junnosuke Yamauchi, and Katsuyoshi Terao, all of Ibaragi, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Jan. 10, 1979, Ser. No. 2,410

Claims priority, application Japan, Jan. 17, 1978, 53-3925

Int. Cl.² C08L *51/00*

U.S. Cl. 525—65 **11 Claims**

1. A pressure-sensitive adhesive composition comprising a liquid rubber, a crosslinking agent therefor and a tackifier, said liquid rubber being a modified low molecular weight polyisoprene which is an adduct of a low molecular weight polyisoprene having a molecular weight of 10,000 to 90,000 with maleic anhydride and/or a derivative thereof in an amount of 0.03 to 7 mol % per isoprene monomer unit is said low molecular weight polyisoprene.

4,204,047

THERMOPLASTIC MOULDING COMPOSITION

Dieter Margotte, and Werner Nouvertné, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,812

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712171

Int. Cl.² C08L *51/04, 33/24, 69/00*

U.S. Cl. 525—67 **5 Claims**

1. A thermoplastic moulding composition comprising

(1) 80 to 20 parts by weight of a thermoplastic polycarbonate based on a bis-(hydroxyaryl)-alkane;

(2) 20 to 80 parts by weight of a graft polymer of 20 to 90% by weight of a mixture of 95 to 5 parts by weight of styrene, methyl methacrylate or a mixture thereof, 50 to 5 parts by weight of acrylonitrile or methacrylonitrile, 50 to 0 parts by weight of a N-substituted maleic imide, the total being 100 parts by weight on 10 to 80% by weight of a rubber;

(3) 0 to 75 parts by weight of a copolymer of 95 to 50% by weight of styrene, methylmethacrylate or a mixture thereof and 50 to 5% by weight of acrylonitrile or methacrylonitrile; and

(4) 2 to 75 parts by weight of a copolymer of 95 to 50 parts by weight of styrene, methylmethacrylate or a mixture thereof, 40 to 5 parts by weight of acrylonitrile or methacrylonitrile, and 2 to 40 parts by weight of a N-substituted maleic imide, selected from the group consisting of N-methyl-maleic imide, N-butyl-maleic imide, N-cyclohexyl-maleic imide, N-phenyl-maleic imide, N-(2-Cl-phenyl)-maleic imide, N-(3-Cl-phenyl)-maleic imide, N-(3-methyl-phenyl)-maleic imide; N-(3,5-dimethyl-phenyl)-maleic imide, N-benzyl-maleic imide and N-(3-methoxy-phenyl)-maleic imide, the total being 100 parts by weight.

4,204,048

HALOPOLYMERS CROSSLINKED WITH A 1,3-DIAMINOPROPANE

James L. Brewbaker, and Rodrique L. Marzett, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1978, Ser. No. 945,944

Int. Cl.² C08F *8/32*

U.S. Cl. 525—343 **17 Claims**

1. A heat-curable, elastomer-forming composition comprising (a) a chlorine- or bromine-containing halopolymer, (b) about 1 to about 15 parts of a 1,3-diaminopropane or salt thereof per hundred parts by weight of the halopolymer, (c) sulfur or a sulfur-containing compound, and (d) an acid acceptor.

4,204,049

HYDROLYTIC POLYMERIZATION OF EPSILON-CAPROLACTAM

Paul Matthies, Heidelberg; Joachim Kunde, Frankenthal, and Werner Hoerauf, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 743,515, Nov. 19, 1976, abandoned. This application Feb. 12, 1979, Ser. No. 11,647

Int. Cl.² C08G *69/16*

U.S. Cl. 526—65 **4 Claims**

1. In a process for the continuous polymerization of ε-caprolactam in the presence of water as an initiator in a vertical downward-flow tubular reactor in which the ε-caprolactam is partially polymerized at elevated temperature in a first reaction zone, mechanically agitated, and is further polymerized in further reaction zones until the desired degree of polymerization into a fiber-forming polymer has been achieved, the resulting molten poly-ε-caprolactam the being discharged, the improvement which consists of carrying out the polymerization at a gauge pressure of from 0.2 to 0.9 bar, constant in all reaction zones, and converting from 20 to 70% of the ε-caprolactam into polymer in said first reaction zone while maintaining the temperature in the first reaction zone according to the relationship $t \leqq 265 + 43\ p$°C., where p is the numerical value of the gauge pressure in bars which relationship is subject to the condition that the temperature in the first reaction zone must be within the range of 260° to 295° C.

4,204,050

POLYMERIZATION OF α-OLEFINS WITH A DUAL TRANSITION METAL CATALYST

Wilbur L. Bressler; Kirby Lowery, Jr., and Fred L. Vance, Jr., all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 9, 1978, Ser. No. 959,287

Int. Cl.² C08F *4/78*

U.S. Cl. 526—97 **6 Claims**

1. A process for polymerizing α-olefins which comprises subjecting one or more α-olefins to Ziegler polymerization conditions in the presence of a catalyst comprising

(a) an inert solid catalyst support containing a metal Ms selected from Mg, Zn, Zr, Si, Ti and mixtures thereof;

(b) the reaction product of a tetravalent hydrocarbyloxy titanium halide or mixture of such compounds and CrO_3 in a mole ratio of CrO_3 to hydrocarbyloxy titanium halide of from about 0.25:1 to about 6:1; and

(c) an organometallic activating agent containing aluminum; and

wherein the atomic ratio of Ms:Ti is from about 0.1:1 to about 1000:1; the atomic ratio of Al:Ti is from about 0.3:1 to about 2000:1.

4,204,051

PROCESS FOR POLYURETHANES FROM ORTHO-ESTER-BLOCKED POLYOLS

Wolfgang Wellner, Cologne, and Hermann Gruber, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

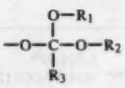
Division of Ser. No. 802,169, May 31, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,265

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625392

Int. Cl.[2] C08G *18/40, 18/48;* C07C *43/32*

U.S. Cl. 528—55 6 Claims

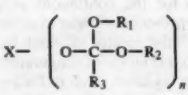
1. A process for the preparation of polyurethanes by the reaction of water and moisture free storage stable mixtures containing polyisocyanates and organic compounds which under the influence of moisture form polyhydroxyl compounds having free hydroxyl groups, characterized in that said organic compounds have at least two groups of the formula



wherein R_1 and R_2 are the same or different and represent aliphatic hydrocarbon groups having from 1 to 6 carbon atoms, and R_3 represents hydrogen or a group which has the same meaning as defined for R_1 or R_2.

2. A moisture free storage stable composition comprising

(a) compounds of the formula



wherein X is the n-valent hydroxyl free residue of an organic polyhydroxyl compound which has a molecular weight of between about 90 and 10,000, R_1, R_2 and R_3 are the same or different and represent C_1 to C_6 aliphatic hydrocarbon groups, and R_3 may also represent hydrogen, and n is an integer of from 2 to 8 inclusive, and

(b) polyisocyanates selected from the group consisting of aliphatic, cycloaliphatic, araliphatic, aromatic and heterocyclic isocyanates, prepolymers of said isocyanates with low molecular weight monomeric polyols, prepolymers of said isocyanates with higher molecular weight polyesters and prepolymers of said isocyanates with higher molecular weight polyethers.

4,204,052

COPOLYMERS OF ACETAL CARBOXYLATES

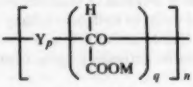
Marvin M. Crutchfield, Creve Coeur; Victor D. Papanu, Maryland Heights, both of Mo., and Craig B. Warren, Rumson, N.J., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 904,067, May 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 826,424, Aug. 22, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,512

Int. Cl.[2] C08G *2/14, 2/30;* C08L *59/02*

U.S. Cl. 525—398 33 Claims

1. A copolymer having the following empirical formula:



where Y is one or more comonomers randomly distributed in the copolymer; the product of q and n averages at least 4; p is at least 1; and M is selected from the group consisting of alkali metal, ammonium, alkyl groups having 1 to about 4 carbon atoms, and alkanol ammonium groups having 1 to about 4 carbon atoms in the alkyl chain.

4,204,053

METHOD FOR THE PRODUCTION OF UREA OF HIGH MECHANICAL STRENGTH

Tore Elstrøm, deceased, late of Porsgrunn, Norway (by Britt Elstrøm, administrator); Per F. Gustavsen, Skien, and Olav Kjøhl, Porsgrunn, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Sep. 13, 1978, Ser. No. 942,498

Claims priority, application Norway, Sep. 19, 1977, 773201

Int. Cl.[2] C08G *12/12*

U.S. Cl. 528—259 5 Claims

1. A method for the production of urea of high mechanical strength by the crystallizing process or the evaporation process, including a prilling or granulating step, utilizing 0.01–1% by weight of formaldehyde in the form of a formaldehyde polymer, which comprises, before prilling or granulating, incorporating in the urea a formaldehyde polymer with a formaldehyde content of 82–97% and with a melting point of about 90°–160° C.

4,204,054

PAPER STRUCTURES CONTAINING IMPROVED CROSS-LINKED CELLULOSE FIBERS

Claude H. Lesas, Colmar, and Michel Pierre, Mulhouse, both of France, assignors to S. A. Beghin-Say, Thumeries, France

Continuation-in-part of Ser. No. 731,895, Oct. 13, 1976, Pat. No. 4,113,936. This application Sep. 7, 1978, Ser. No. 940,188

Claims priority, application France, Oct. 20, 1975, 75 31965; Aug. 1, 1978, 78 22657

Int. Cl.[2] D06M *13/14*

U.S. Cl. 536—56 23 Claims

1. Fibrous structure in sheet form having the composition as follows:

10% to 90% by weight of pulp consisting essentially of cellulosic fibers cross-linked with formaldehyde, the predominant cross-linking being at the surface area of said fibers and in an amount sufficient to impart flexibility and softness to said fibers; and

90% to 10% by weight of an additional binding product, said amount being selected to ensure sufficient strength and cohesion to the structure of said sheet.

4,204,055

CROSS-LINKED CELLULOSE FIBERS

Claude H. Lesas, Colmar, and Michel Pierre, Mulhouse, both of France, assignors to S. A. Beghin-Say, Thumeries, France

Continuation-in-part of Ser. No. 731,895, Oct. 13, 1976, Pat. No. 4,113,936. This application Sep. 7, 1978, Ser. No. 940,189

Claims priority, application France, Oct. 20, 1975, 75 31965

Int. Cl.[2] D06M *13/14*

U.S. Cl. 536—56 10 Claims

1. Cellulose fibers cross-linked with formaldehyde by the process comprising the steps of

(1) spraying of formaldehyde as a mixture with hydrochloric acid and formic acid on individualized cellulose fibers;

(2) immediately after said spraying, introducing said fibers which have the reagents of step (1) uniformly disposed thereon into an air stream having a temperature of from about 60° and about 250° C., and a velocity of from about 1–20 m/sec during a curing-time period ranging between about 1 and 20 seconds to effect a cross-linking reaction; and

(3) separating said fibers from said air stream.

10. Cellulose fibers cross-linked with formaldehyde, at least 50% of the cross-linking bridges being at the surface area of the fibers, thereby imparting flexibility and softness to the fibers.

4,204,056

PROCESS AND INTERMEDIATES FOR PREPARING FIBER-REACTIVE PHTHALOCYANINE DYES

Rolf Müller, Karben, and Joachim Ribka, Offenbach am Main-Bürgel, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main Fechenheim, Fed. Rep. of Germany

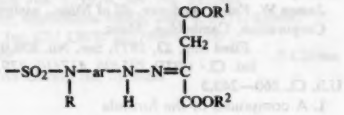
Division of Ser. No. 786,819, Apr. 12, 1977. This application Sep. 21, 1978, Ser. No. 944,641

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617062

Int. Cl.[2] C07B *47/04*

U.S. Cl. 542—416 1 Claim

1. A water-soluble phthalocyanine dye in which there is substituted on the phthalocyanine nucleus up to four groups having the structure



wherein

R is hydrogen or alkyl having up to 6 carbons,

R^1 is an alkyl radical which has 2–6 carbon atoms and is substituted by Cl, Br, OH or alkoxy having 1–4 carbon atoms, or an unsubstituted alkyl radical having 1–18 carbon atoms,

R_2 is an alkyl radical which has 2–6 carbon atoms is substituted by Cl, Br, OH or alkoxy having 1–4 carbon atoms, or denotes an unsubstituted alkyl radical having 1–18 carbon atoms, and

ar is a carbocyclic divalent aromatic or araliphatic group containing up to two benzene rings and up to 16 carbons, the NH group of the hydrazone moiety being attached to a benzene ring.

4,204,057

9-DEOXY-6,9α-EPOXYMETHANO-PG C-1 AMINES

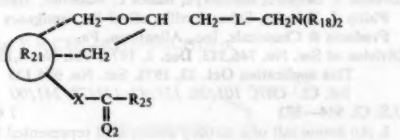
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 788,145, Apr. 19, 1977, Pat. No. 4,130,569. This application Sep. 11, 1978, Ser. No. 941,481

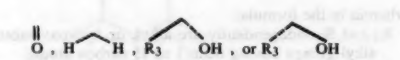
Int. Cl.[2] C07D *311/02*

U.S. Cl. 542—426 12 Claims

1. A cyclic ether of the formula



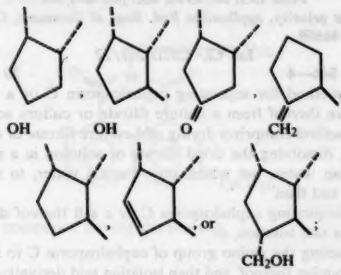
wherein L is (1) a valence bond, (2) $—(CH_2)_d—$ wherein d is one to 5 inclusive, (3) $—(CH_2)_t—CF_2—$ wherein t is 2, 3, or 4, (4) $—CH_2—CH=CH—A—$ wherein A is a valence bond or $—(CH_2)_h—$ wherein h is one, 2, or 3, or (5) $—CH_2—O—CH_2—Y—$ wherein Y is a valence bond or $—(CH_2)_k—$ wherein k is one or 2; wherein Q_2 is



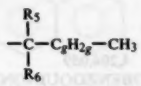
wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_{18} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, the two R_{18}'s being the same or different;

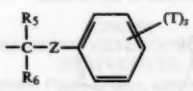
wherein R_{21} is



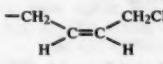
wherein R_{25} is


(1)

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_5R_6—$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;


(2)

wherein R_5 and R_6 are as defined above with the proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive between $—CR_5R_6—$ and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; or



wherein X is cis- or trans-$CH=CH—$, $—C\equiv C—$, or $—CH_2CH_2—$; and wherein the wavy line (~) indicates attachment in cis or trans configuration.

4,204,058

PROCESS FOR OBTAINING CEPHALOSPORIN C AND THE SALTS AND DERIVATIVES THEREOF FROM CULTURE FILTRATES OR CULTURE SOLUTIONS

Laszlo Vértesy, Eppstein, and Gerhard Huber, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,896

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748659

Int. Cl.[2] C07D *501/12*

U.S. Cl. 544—4 20 Claims

1. A method for separating cephalosporin C or a salt or derivative thereof from a culture filtrate or culture solution, which method comprises drying said culture filtrate or culture solution, dissolving the dried filtrate or solution in a solvent other than water, but which may contain water, to form a solution and then

(a) precipitating cephalosporin C or a salt thereof directly from said solution, or

(b) reacting the amino group of cephalosporin C to form a derivative thereof, and then isolating said derivative from said solution as the free acid or a salt thereof.

4,204,059

DIAMINOBENZOQUINONES

Andrée Bugaut, Boulogne-sur-Seine, and Monique Laudon, Gagny, both of France, assignors to L'Oreal, Paris, France

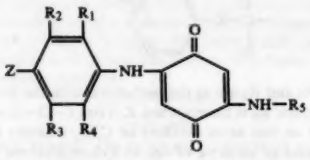
Division of Ser. No. 762,272, Jan. 25, 1977, Pat. No. 4,084,052, which is a division of Ser. No. 600,786, Jul. 31, 1975, Pat. No. 4,023,926, which is a division of Ser. No. 370,737, Jun. 18, 1973, Pat. No. 3,919,265. This application Dec. 21, 1977, Ser. No. 862,827

Claims priority, application Luxembourg, Jun. 21, 1972, 65555; Jan. 23, 1973, 66883

Int. Cl.[2] C07D *295/14*

U.S. Cl. 544—166 2 Claims

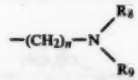
1. Diaminobenzoquinone of the formula



wherein,

R_1, R_2, R_3 and R_4 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy,

R_5 represents a member selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl and amino alkyl of the formula



wherein n is 2–6 and R_8 and R_9 each independently represent a member selected from the group consisting of hydrogen, lower alkyl and hydroxy lower alkyl; and

Z is morpholinyl.

4,204,060

NOVEL MONOCHLORO-S-TRIAZINE DERIVATIVES

Gerrit Hoentjen, Westervoort; Stephanus A. G. de Graaf, Renkum; Albert H. Bijkerk, Rheden, and Cornelis R. H. I. de Jonge, De Steeg, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 651,086, Jan. 21, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,371

Claims priority, application Netherlands, Oct. 4, 1974, 7511696

Int. Cl.[2] C07D *251/26*

U.S. Cl. 544—218 4 Claims

1. 2,4-Distearoxy-6-chloro-s-triazine.

4,204,061

SULFAM(NA)PHTHALEINS

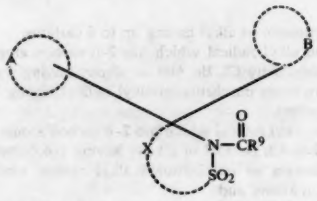
Stanley M. Bloom, Waban; Alan L. Borror, Lexington, and James W. Foley, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 836,021

Int. Cl.[2] C07D *275/06, 417/10, 279/02*

U.S. Cl. 260—243.3 45 Claims

1. A compound of the formula



wherein A is a 4'-hydroxy-1'-phenyl moiety or a 4'-hydroxy-1'-naphthyl moiety; B is a phenyl moiety or a naphthyl moiety, provided A is said 4'-hydroxy-1'-phenyl moiety when B is said naphthyl moiety; X represents the carbon atoms necessary to complete 2,3-dihydrobenz[d]isothiazole-1,1-dioxide or 2,3-dihydronaphtho[1,8-de]-1,2-thiazine-1,1-dioxide; and R^9 is selected from methyl, unsubstituted or substituted with one halo group selected from chloro, bromo and fluoro or substituted with two of said halo groups; and phenyl, unsubstituted or substituted in the para position with a group selected from alkyl having 1 to 4 carbon atoms, dimethylamino and nitro.

4,204,062

AMINE SALTS OF TERTIARY AMINO ACIDS

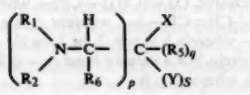
Ibrahim S. Bechara, Boothwyn; Rocco L. Mascioli, Media, and Philip J. Zaluska, Schnecksville, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 746,313, Dec. 1, 1976, Pat. No. 4,134,994. This application Oct. 23, 1978, Ser. No. 954,133

Int. Cl.[2] C07C *101/20, 121/42, 121/78, 241/00*

U.S. Cl. 544—351 7 Claims

1. An amine salt of a tertiary amino acid represented by the formula:



wherein in the formula:

R_1 and R_2 independently are alkyl, or hydroxy-substituted alkyl groups having from 1 to 15 carbon atoms;

R_5 is hydrogen, a lower alkyl group having from 1 to 6 carbon atoms, an alkenyl group having from 2 to 6 carbon atoms, an aryl group, a cycloaliphatic or alkyl substituted cycloaliphatic group with the alkyl portion having from 1

to 6 carbons, or a keto alkyl group with the alkyl portion having from 1 to 6 carbon atoms;
R_6 is hydrogen, or a radical selected from the group consisting of alkyl, phenyl and napthyl groups;
X is an amine salt of a carboxylic acid group;
Y is a nitrile group; and
q is 0 or 1; p is 1 or 2; S is 0 or 1; and p+q+S is 3.

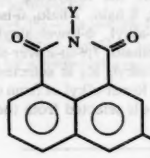
4,204,063

N(AMINOALKYL)-NAPHTHALIMIDES AND THEIR DERIVATIVES

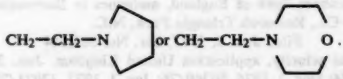
Miguel F. Brana; Antonio M. Sanz; Rafael P. Alvarez-Ossorio; Cristobal M. Roldan, and Cristina R. Fernandez de Gamboa, all of Madrid, Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Jun. 2, 1978, Ser. No. 911,801
Claims priority, application Spain, Jun. 4, 1977, 459497
Int. Cl.² C07D *401/06, 413/06*
U.S. Cl. 546—99 **5 Claims**

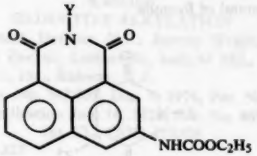
1. A compound having the formula



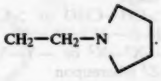
wherein Y is $CH_2—CH_2N(CH_3)_2$,



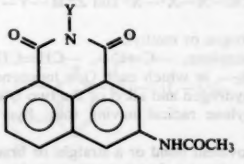
2. A compound having the formula



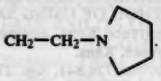
wherein Y is $CH_2—CH_2—N(CH_3)_2$ or



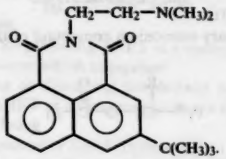
3. A compound having the formula



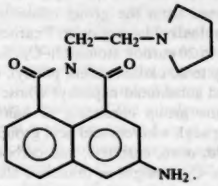
wherein Y is $CH_2—CH_2—N(CH_3)_2$ or



4. A compound having the formula



5. A compound having the formula



4,204,064

SULFUR CONTAINING HETEROCYCLIC AMINO ACID DERIVATIVES

Gregoire Kalopissis, Paris, France, assignor to L'Oreal, Paris, France

Division of Ser. No. 714,000, Aug. 12, 1976, Pat. No. 4,085,217, which is a division of Ser. No. 501,615, Aug. 29, 1974, Pat. No. 3,976,781, which is a division of Ser. No. 203,046, Nov. 29, 1971, Pat. No. 3,849,576, which is a continuation-in-part of Ser. No. 736,960, Jun. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 427,976, Jan. 25, 1965, abandoned, and Ser. No. 602,480, Dec. 19, 1966, abandoned, and Ser. No. 794,363, Jan. 27, 1969, abandoned, and Ser. No. 801,840, Feb. 24, 1969, abandoned, and Ser. No. 858,161, Sep. 15, 1969, Pat. No. 3,671,643, and Ser. No. 12,122, Feb. 17, 1970, abandoned, and Ser. No. 36,405, May 11, 1970, abandoned. This application Jan. 24, 1978, Ser. No. 871,839
Claims priority, application France, Jan. 29, 1964, 64.961897; Luxembourg, Dec. 22, 1965, 50125; France, Jun. 21, 1967, 67 111396; Jul. 28, 1967, 67.116160; Luxembourg, Jan. 29, 1968, 55371; Feb. 23, 1968, 55553; Feb. 19, 1969, 58042; Apr. 19, 1969, 55935; May 12, 1969, 58634; Belgium, Jun. 3, 1969, 74877; Luxembourg, Apr. 23, 1971, 63056; Apr. 23, 1971, 63057
Int. Cl.² C07D *211/20*
U.S. Cl. 546—245 **3 Claims**

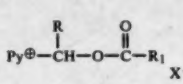
1. A compound selected from the group consisting of 3-(β-piperidinocarbonyl ethylthio) alanine and 2-acetamido 3 pyrrolidinocarbonylmethylthio propionic acid.

4,204,065
SOFT QUATERNARY SURFACE ACTIVE AGENTS AND METHOD OF USING SAME

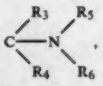
Nicolae S. Bodor, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence, Kans.

Continuation of Ser. No. 726,841, Sep. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,519, Sep. 22, 1975, Pat. No. 3,989,711. This application Dec. 13, 1978, Ser. No. 969,255
Int. Cl.[2] A61K *31/465*
U.S. Cl. 546—316 108 Claims

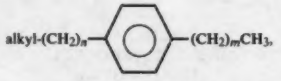
1. A quaternary ammonium compound of the formula:



wherein Py is an N-heterocyclic unsaturated ring system comprising a basic nulceus selected from the group consisting of pyridyl and 3-carboloweralkoxypyridyl, 3-carbamoylpyridyl and 3-(N-loweralkylcarbamoyl)pyridyl; wherein R represents a member selected from the group consisting of hydrogen, C_1–C_{20} alkyl, cycloalkyl having up to 7 carbon atoms, alkoxyalkyl having up to 20 carbon atoms, C_1–C_{20} haloalkyl, carboxyalkyl having up to 20 carbon atoms, phenyl, naphthyl, substituted phenyl and substituted naphthyl whose substituents are selected from the group consisting of halogen, O—C_1–C_4 alkyl, O—C_1–C_8 acyl, wherein said acyl group is derived from a carboxylic acid, nitro, carboxyl, and carboethoxy; wherein R_1 represents C_9–C_{22} straight or branched alkyl, —$(CH_2)_n$—



wherein R_3, R_4, R_5 and R_6 are each selected from the group consisting of hydrogen, methyl, and ethyl, C_1–C_{22} straight or branched



wherein n in each occurrence and m represent an integer of from 0 to 22, —$(CH_2CH_2O)_p$, wherein the p represents an integer of from 0 to 22, and the radical which results from decarboxylation of a naturally occuring bile acid; and wherein X is a nontoxic, pharmaceutically acceptable anion.

4,204,066
PREPARATION OF ALKYL PYRIDINES

Tamotsu Imai, Mt. Prospect, and Edwin H. Homeier, Maywood, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 1, 1978, Ser. No. 965,670
Int. Cl.[2] C07D *213/12*
U.S. Cl. 546—348 9 Claims

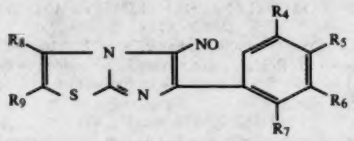
1. A process for the preparation of alkyl pyridine which comprises reacting a mixture of ethylene, carbon monoxide, hydrogen and ammonia in the presence of a metal phthalocyanine catalyst complex in which the metallic portion is selected from the transition metals of Groups IB and VIII of the Periodic Table, and recovering the resultant alkyl pyridine.

4,204,067
DERIVATIVES OF IMIDAZO[2,1-b] THIAZOLE

Parimal K. Adhikary, 510 Basswood Dr., Apt. No. 6, Nashville, Tenn. 37209

Division of Ser. No. 857,854, Dec. 5, 1977, Pat. No. 4,160,840, which is a continuation of Ser. No. 726,390, Sep. 24, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,090
Int. Cl.[2] C07D *277/08*
U.S. Cl. 548—154 2 Claims

1. A compound having the formula



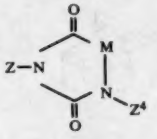
wherein R_4, R_5, R_6, and R_7 are selected from the group consisting of hydrogen, halogen and lower-alkyl of from one to four carbon atoms, inclusive, with the proviso that when taken together they constitute the following substituents on the tetracyclic ring, 9-halo, 8-halo, 7-halo, 6-halo, 9-lower-alkyl, 8-lower-alkyl, 7-lower-alkyl, 6-lower-alkyl, 7,9-dihalo, 7,8-dihalo, 6,8-dihalo, 6,7-dihalo, 7,9-di-lower-alkyl, 7,8-di-lower-alkyl and 4,6-di-lower-alkyl; R_8 is selected from the group consisting of hydrogen, lower-alkyl of from one to four carbon atoms, inclusive, and R_9 is selected from the group consisting of hydrogen and halo.

4,204,068
NITROGEN HETEROCYCLES

Albert G. Caldwell, West Wickham, and Norman Whittaker, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 2, 1977, Ser. No. 802,644
Claims priority, application United Kingdom, Jun. 3, 1976, 22877/76; Dec. 2, 1976, 50340/76; Jan. 1, 1977, 23071/77; Mar. 23, 1977, 12145/77
Int. Cl.[2] C07D *233/76, 233/78*
U.S. Cl. 548—313 2 Claims

1. A compound of formula



wherein

Z is hydrogen or alkyl;

M is $>C{=}Z^3$, $>CH{-}CHO$ or $>CH{-}CH(OG^3)_2$, G^3 being alkyl; and

Z^4 is $-CH_2{-}X{-}X^1{-}X^2$ or $-Y{-}Y^1{-}Y^2{-}Y^3$, except when M is $C{=}Z^3$ whereupon

either

Z^3 is $=CR{-}CH_2{-}Y^1{-}Y^2{-}Y^3$ and Z^4 is $-CH_2{-}X{-}X^1{-}X^2$, or

Z^3 is $=CH{-}X{-}X^1{-}X^2$ and Z^4 is $-Y{-}Y^1{-}Y^2{-}Y^3$;

wherein

R is hydrogen or methyl;

X is phenylene, $-C{\equiv}C-$, $-CH{=}CH-$ or $-CH_2{-}CQ_2-$, in which each Q is independently selected from hydrogen and alkyl or the two Q's together form an alkylene radical having four, five or six carbon atoms;

X^1 is a covalent bond or a straight or branched alkylene chain having 1 to 6 carbon atoms, optionally having one of its methylene groups replaced by oxa (—O—) pro-

vided that at least one carbon atom separates the oxa group from a —C≡C—, —CH=CH— or —CO— group;

X^2 is selected from 5-tetrazolyl, carboxyl, carboxamide, hydroxymethylene and alkoxycarbonyl;

Y is $—CR_2—CH_2—$ in which each R is independently as defined above;

Y^1 is carbonyl, methylene, methylene substituted by hydroxyl, or methylene substituted by hydroxyl and alkyl;

Y^2 is a covalent bond or straight or branched alkylene having 1 to 7 carbon atoms, optionally substituted on the carbon adjacent Y^1 by one or two groups independently selected from alkyl, cycloalkyl and bicycloalkyl; and

Y^3 is hydrogen, hydroxy, alkoxy having 1 to 7 carbon atoms, cycloalkyl, bicycloalkyl, phenyl, benzyl, phenoxy or benzyloxy,

wherein each of phenyl, benzyl, phenoxy and benzyloxy may be substituted in the benzene ring by one or more groups selected from hydroxy, halogeno, nitro, amino, acylamino, alkenyl, alkoxy, phenyl, and alkyl which may itself be substituted by one or more halogeno groups; or

Y is a bond, $—CH_2—$ or $—CH_2.CH_2—$; and

Y^1, Y^2 and Y^3 taken together form a cycloalkyl group substituted by a hydroxyl group;

and salts thereof.

4,204,069

REDUCTIVE ALKYLATION

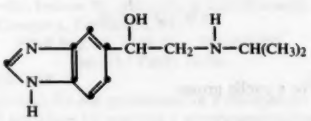
Carroll D. Arnett, Durham, N.C.; Jeremy Wright, Baltimore, and Nicolas Zenker, Lutherville, both of Md., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 747,661, Dec. 6, 1976, Pat. No. 4,082,847. This application Jan. 16, 1978, Ser. No. 869,970

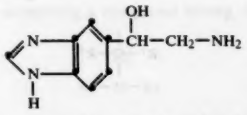
Int. Cl.[2] C07D *235/08*

U.S. Cl. 548—325 **3 Claims**

1. A process for preparing a compound having the formula



which comprises the reductive alkylation of a compound having the formula



with acetone in the presence of anhydrous Na_2SO_4.

4,204,070

PROCESS FOR PREPARING POLYETHYLENE TEREPHTHALATE AND ITS LOW MOLECULAR WEIGHT OLIGOMERS

Fumiyuki Suzuki; Toshimitu Okutu, and Keitaro Ohe, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 23, 1976, Ser. No. 679,612

Claims priority, application Japan, Apr. 23, 1975, 50-49350

Int. Cl.[2] C07C *69/82*

U.S. Cl. 560—94 **6 Claims**

1. A process for preparing BHET in a reactor provided with a rectifying column which comprises:

(i) suspending or dissolving terephthalic acid in a molten liquid of BHET at a temperature above the dew point of ethylene glycol;

(ii) feeding gaseous or liquid ethylene glycol into the suspension or the solution in said reactor to react it at a temperature of about 197° to about 300° C. with the terephthalic acid, wherein the feeding of ethylene glycol to the reactor is controlled so that the temperature inside of and at a position at the top of the rectifying column is maintained at about 100° to about 120° C. at which more than about 3% of the ethylene glycol does not distill off from the rectifying column and the partial pressure of the ethylene glycol is maximized, said control being maintained by

(iii) discontinuing feeding of the ethylene glycol when the temperature at a position about ¼ to about 1/5 below the top of the rectifying column rises to a temperature within the range of about 110° C. to about 160° C.; and

(iv) continuing feeding of the ethylene glycol when the temperature at said position about ¼ to about 1/5 below the top of the rectifying column falls to 0° to about 5° C. lower than the temperature point in step (iii).

4,204,071

4-ARYL-3-BUTENOIC ACIDS AND LOWER ALKYL ESTERS

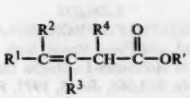
Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed May 4, 1978, Ser. No. 902,624

Int. Cl.[2] C07C *63/60, 69/76*

U.S. Cl. 560—100 **18 Claims**

1. A compound of the formula:



wherein,

R′ is hydrogen or lower alkyl;

R^1 is naphthyl, phenyl or substituted phenyl in which the phenyl group is substituted at one, two or three of the ring carbon atoms with lower alkyl, lower haloalkyl, lower alkoxy or halogen;

each of R^2 and R^3 is independently selected from hydrogen, chloro, fluoro or methyl; and

R^4 is lower alkyl of 2 to 5 carbon atoms.

4,204,072

TRIS(N-CARBALKOXYLAMINOMETHYL)PHOSPHINES

Arlen W. Frank, Slidell, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 29, 1978, Ser. No. 964,751

Int. Cl.[2] C07C *125/06*; D06M *13/44*

U.S. Cl. 560—158 **8 Claims**

1. A tris(N-carbalkoxylaminomethyl)phosphine compound

having the formula $(RO_2CNHCH_2)_3P$, where R is an alkyl radical having from 1 to 6 carbon atoms.

3. A process for preparing a tris(N-carbalkoxylaminomethyl)phosphine which comprises reacting a tetrakis(N-carbalkoxylaminomethyl)phosphonium salt having the formula $(RO_2CNHCH_2)_4P^+X^-$, where R is an alkyl radical having from 1 to 6 carbon atoms and X is an inorganic acid radical, with a base capable of forming a salt with the inorganic acid HX, and recovering the product from the resulting reaction mixture.

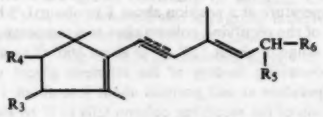
4,204,073

PROCESS FOR PRODUCING CAROTENOIDS

Frank Kienzle, Flüh, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 815,470, Jul. 14, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,624
Claims priority, application Austria, Aug. 2, 1976, 5705/76
Int. Cl.² C07C *69/52, 67/02*
U.S. Cl. 560—231 **4 Claims**

1. A compound of the formula



wherein R_5 is hydroxy, R_6 is hydrogen, or R_5 and R_6 taken together forms oxo; R_4 is hydroxy, oxo or acyloxy; R_3 is oxo or hydroxy, with the proviso that when R_5 is hydroxy and R_4 is oxo or acyloxy, R_3 is oxo and the dotted bond can be optionally hydrogenated and with the further proviso that when R_5 and R_6 are oxo, R_3 is oxo.

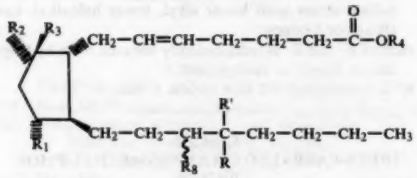
4,204,074

16-SUBSTITUTED PROSTAGLANDINS

George W. Holland, and Perry Rosen, both of North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 813,068, Jul. 5, 1977, Pat. No. 4,163,016. This application Apr. 6, 1979, Ser. No. 27,631
Int. Cl.² C07C *127/00*
U.S. Cl. 562—503 **2 Claims**

1. A compound of the formula:



wherein R_4 is hydrogen or lower alkyl; R_2 is hydroxy or taken together forms oxo; R_1 is lower alkyl; R' is lower alkyl and R is hydrogen or lower alkyl; R_8 is hydroxy, benzoyloxy, lower alkanoyloxy, benzoyloxy, benzhydryloxy, trimethylsilyloxy or tetrahydropyranyloxy or their enantiomers or racemates thereof.

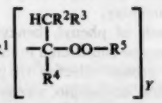
4,204,075

PROCESS FOR DI-ORGANIC PEROXIDES

Richard A. Bafford, Tonawanda, and Orville L. Mageli, Kenmore, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 771,334, Oct. 28, 1968, Pat. No. 4,061,317. This application Aug. 30, 1978, Ser. No. 938,192
Int. Cl.² C07C *179/06*
U.S. Cl. 568—562 **4 Claims**

1. A process for purifying, an impure organic peroxide having the general formula



produced by a solvolysis reaction of an aralkyl halide with a hydroperoxide in the presence of an olefin corresponding to the dehydrohalogenated aralkyl halide wherein the impurities are generally substituted benzene derivatives, said impure peroxide being essentially free of acidic materials and said impurities having an appreciable lower boiling point than said peroxide which process comprises charging said impure peroxide along with about 2–10 parts by weight of liquid water, based on said impure peroxide, to a distillation zone and vaporizing water and impurities at a temperature of about 30°–80° C. at a pressure of about 0.01–0.5 atmospheres and continuing said vaporization until essentially no oily liquid is obtained in a condensor receiving vapors from said zone, under conditions such that a substantial amount of liquid water is present in said zone in contact with peroxide product, wherein

(a) Y is an integer equal to 1, 2 or 3;

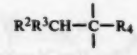
(b) R^1 is phenyl or naphthyl;

(c) R^2 and R^3 are each H, alkyl, cycloalkyl, phenyl or a corresponding halo-substituted radical;

(d) R^4 is alkyl, cycloalkyl, phenyl or a corresponding halo-substituted radical;

(e) R^2 and R^3 may join with the common carbon to which they are attached to form the cyclic group;

(f)



may be a cyclic group;

(g)

may be a fused ring group; and

(h) R^5 is an aliphatic or cycloaliphatic hydrocarbon radical.

4,204,076
HYDROQUINONE DIMETHYL ETHER

Elmar Konz, Bad Soden am Taunus, and Rudolf Pistorius, Ober-Möorlen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 871,921, Jan. 24, 1978, Pat. No. 4,161,614. This application Nov. 15, 1978, Ser. No. 960,857

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703077

Int. Cl.[2] C07C *41/00*

U.S. Cl. 568—648 **3 Claims**

1. A method of preparing hydroquinone dimethyl ether, which comprises catalytically dehydrogenating cyclohexanedione-(1,4)-tetramethyl diketal and splitting off methanol.

4,204,077
ETHERIFICATION PROCESSING OF LIGHT HYDROCARBONS

Hanbury J. Woods, Campbellville; John D. Chase, Oakville, and Buenaventura B. Galvez, Islington, all of Canada, assignors to Gulf Canada Limited, Toronto, Canada

Filed Oct. 2, 1978, Ser. No. 948,072

Int. Cl.[2] C07C *41/00, 41/10, 41/12*

U.S. Cl. 568—697 **10 Claims**

1. A method for processing an olefinic hydrocarbon stream consisting essentially of a mixture including both four and five carbon atom etherifiable olefins, for the formation of high octane components for blending into gasoline, said method comprising

a. passing said stream into an etherification reactor with a proportion of methanol under etherifying conditions, to contact an etherification catalyst therein and etherify tertiary olefins in said stream,

b. passing the entire effluent stream from said etherification reactor into a glycol contacting unit and contacting it therein with a stream of liquid glycol to remove methanol from said effluent and reduce the methanol concentration in the effluent stream to no greater than 200 mole ppm in said effluent,

c. separating said effluent stream from said glycol and fractionally distilling the reduced effluent to separate a distillate containing hydrocarbons of predominantly four carbon atoms each and no greater than 200 mole ppm methanol from a higher boiling high octane fraction containing ethers and hydrocarbons of predominantly more than four carbon atoms each.

4,204,078
PROCESS FOR THE PREPARATION OF NITROPHENYL HYDROXY SUBSTITUTED ACETYLENES

Edward T. Sabourin, Allison Park, and Charles M. Selwitz, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

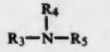
Filed Sep. 13, 1978, Ser. No. 942,068

Int. Cl.[2] C07C *33/04*

U.S. Cl. 568—705 **21 Claims**

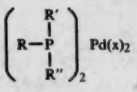
1. In a process for the production of a nitrophenyl hydroxy substituted acetylene by reacting a nitrobromobenzene with a substituted terminal acetylene compound containing at least three carbon atoms and an hydroxy group on the carbon atom adjacent to the acetylene group in the presence of a reaction mixture comprising:

(i) a solvent comprising a compound having the formula:



where R_3, R_4, and R_5 can be the same or different and are selected from the group consisting of hydrogen and lower alkyl groups having from 1 to 4 carbon atoms with the proviso that no more than one of said R groups can be hydrogen;

(ii) a catalyst comprising a compound having the formula:



where x can be Br, I, or Cl;

and where R, R′ and R″ can be the same or different and are selected from the group consisting of phenyl, substituted phenyl and alkyl groups having from 1 to 4 carbon atoms, and

(iii) a promoter comprising cuprous iodide;

the improvement which comprises reacting said nitrobromobenzene in the added presence of a sufficient amount of excess trisubstituted phosphine over that amount needed to form said catalyst to result in a yield of desired nitrophenyl hydroxy acetylene of at least 90 weight percent.

4,204,079
2-DECARBOXY-2-HYDROXYMETHYL-CIS-4,5-DIDEHYDRO PGF$_1$ COMPOUNDS

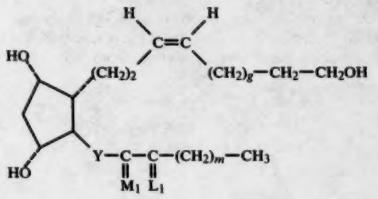
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 778,649, Mar. 17, 1977, which is a division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Jul. 12, 1978, Ser. No. 923,770

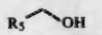
Int. Cl.[2] C07C *177/00*

U.S. Cl. 568—838 **22 Claims**

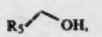
1. A prostaglandin analog of the formula



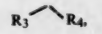
wherein Y is trans -CH=CH-;
wherein M_1 is

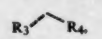


or



wherein R_5 is hydrogen or methyl;
wherein L_1 is





or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein g is one, 2, or 3; and

wherein m is one to 5, inclusive.

4,204,080

HYDROGENATION PROCESS FOR THE SELECTIVE PREPARATION OF 3-MENTHENE

James O. Bledsoe, Jr., and Carlos G. Cardenas, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,138

Int. Cl.[2] **C07C** *5/06, 5/30;* **B01J** *23/46*

U.S. Cl. 585—273 **10 Claims**

1. A process for catalytically hydrogenating a non-conjugated paramenthadiene having one site of unsaturation at the 4(8)-or the 8-position, for selectively forming 3-menthene which comprises:

contacting with hydrogen gas under hydrogenation conditions a reaction mixture comprising said para-menthadiene, a catalytic proportion of a ruthenium (II) catalyst complex, and an organic solvent in which said catalyst complex is homogeneously dispersed, until said 3-menthene is formed, said catalyst complex restricted to one which is capable of catalyzing a selective hydrogenation of a cyclic polyene to a cyclic monoene.

4,204,081

SELECTIVE HYDROGENATION OF CYCLOPENTADIENE TO FORM CYCLOPENTENE

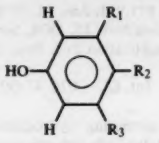
Henry R. Menapace, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 30, 1978, Ser. No. 938,159

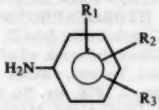
Int. Cl.[2] **C07C** *5/06, 5/16, 13/12*

U.S. Cl. 585—274 **5 Claims**

1. A process for the preparation of cyclopentene which comprises selectively hydrogenating cyclopentadiene in the liquid phase by contacting cyclopentadiene with hydrogen in the presence of a hydrogenation catalyst comprising (1) a soluble nickel compound, (2) an aluminum trialkyl compound or a lithium alkyl and (3) at least one cocatalyst compound selected from the group consisting of H_2O; NH_3;



where R_1, R_2 and R_3 may be hydrogen or an alkyl radical containing from 1 to 6 **carbon atoms;**



where R_1, R_2 and R_3 may be hydrogen or halogen, or an alkyl radical containing from 1 to 6 carbon atoms; $R_1O\ R_2$ wherein R_1 and R_2 may be the same or different alkyl radicals containing from 1 to 6 carbon atoms; and

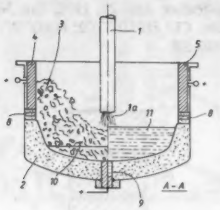
wherein R_1 may be alkyl or an aromatic radical containing from 1 to 8 carbon atoms and R_2 may be hydrogen or an alkyl or aromatic hydrocarbon radical containing from 1 to 8 carbon atoms.

4,204,082

DC ARC FURNACE HAVING STARTING ELECTRODE

Sven-Einar Stenkvist, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Nov. 13, 1978, Ser. No. 959,480
Claims priority, application Sweden, Nov. 16, 1977, 7712920
Int. Cl.[2] H05B 7/00
U.S. Cl. 13—9 R 4 Claims



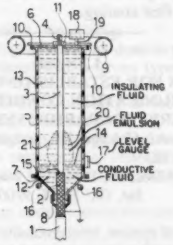
1. A DC arc furnace comprising a furnace vessel having a hearth adapted to contain a melt and a side wall extending upwardly from said hearth, an arcing electrode positioned above said hearth, said hearth having a hearth electrode requiring contact by molten metal to be effective, and starting electrode means for contacting scrap charged in said vessel to put arcing current in the scrap until said molten metal is formed, said means comprising a plurality of elongated, electrically conductive plate-like elements built into said side wall and forming fixed immovable parts thereof, said elements being circumferentially interspaced and being vertically positioned so that scrap initially charged in said vessel gravitationally leans against the elements and solely thereby forms electrical connection therewith, said arcing electrode being connected for operation with one polarity and said hearth electrode and said elements being connected for operation with the opposite polarity, said electrical connection of any one of said elements being insufficient to put said arcing current in the scrap and the elements being provided in sufficient number to cumulatively put the arcing current into the scrap.

4,204,083

TERMINATION ON ELECTRIC POWER CABLES FOR NORMAL, HIGH AND VERY HIGH VOLTAGES

Adriano Isotton, Latina, Italy, assignor to Angelo Mariani, Italy

Filed Nov. 14, 1977, Ser. No. 851,188
Claims priority, application Italy, Nov. 18, 1976, 16907 A/76
Int. Cl.[2] H02G 15/02
U.S. Cl. 174—9 F 7 Claims



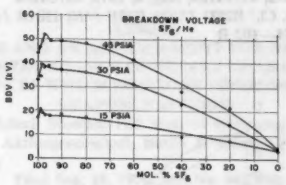
1. A termination on a shielded electric cable for normal, high or very high voltage, comprising a housing for accommodating an end length of the cable, an electric cable comprising a conductor, insulation surrounding said conductor and a shield around said insulation, an end length of said cable being received in said housing with an end section of said shield in said housing and with said conductor and insulation in said housing extending beyond said shield, a terminal electrically connected to the end of said conductor, a body of conductive liquid in said housing immersing said end section of said shield and a body of insulating liquid at least partially filling the remaining space within said housing, and means for sealing said bodies of liquid in said housing.

4,204,084

APPARATUS WITH DIELECTRIC GAS MIXTURES IN SUBSTANTIALLY UNIFORM FIELD

Martin J. Mastroianni, East Aurora, and Sabatino R. Orfeo, Orchard Park, both of N.Y., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Jun. 26, 1978, Ser. No. 919,338
Int. Cl.[2] H01B 3/16
U.S. Cl. 174—25 G 7 Claims



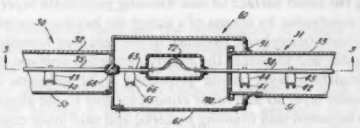
1. In a high voltage electrical apparatus having at least two electrical conductors separated by an insulative dielectric gas subjected to a substantially uniform electrical field, the improvement wherein the insulative gas consists essentially of about 1 to about 10 mole % of a noble gas and about 90 to about 99 mole % of sulfur hexafluoride.

4,204,085

SEISMIC-PROOF BUS DUCT JOINT

Frank X. Chapman, Perkasie, Pa.; Charles R. Gallant, Beach Haven Park, N.J., and Charles V. Stull, Ambler, Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 26, 1978, Ser. No. 910,079
Int. Cl.[2] H02G 5/08, 3/06
U.S. Cl. 174—86 11 Claims



1. A bus duct joint for connecting the adjacent ends of first and second bus duct units in a manner which allows a given displacement of said ends of said bus duct units relative to one another; each of said bus duct units including at least one elongated bus bar supported within and insulated from an elongated sheet metal housing which is rectangular in cross-section; said bus duct joint comprising a sheet metal housing which is rectangular in cross-section and which has first and second ends; said first and second ends each having enlarged openings; said housing of said first bus duct unit being fixed to said first end of said housing of said joint with its interior communicating through said opening in said first end with the interior of said bus duct joint housing; said housing of said second bus duct unit passing through said enlarged opening in said second end of said joint housing and partially into the interior of said joint housing; said second enlarged opening being spaced from the outer surface of said housing of said second bus duct unit by given dimensions, thereby to permit lateral movement of said second bus duct housing relative to said joint housing; flexible conductor means disposed within

said joint housing for connecting each of said at least one elongated bus bar of said first and second bus duct units to one another; and sealing means extending across the space between said outer surface of second bus duct unit housing and said joint housing for covering said opening regardless of the relative position of said last-mentioned housings.

4,204,086

PROCESS FOR THE PRODUCTION OF HIGHLY EXPANDED POLYOLEFIN INSULATED WIRES AND CABLES

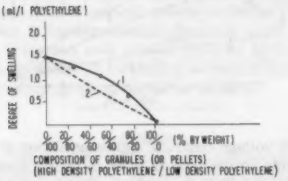
Fumio Suzuki, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 420,486, Nov. 30, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 661,875

Claims priority, application Japan, May 23, 1972, 47/59459; Sep. 21, 1972, 47/94129; Aug. 8, 1973, 48/88298

Int. Cl.[2] B29D *27/00;* **B29F** *3/10;* **H01B** *11/05*

U.S. Cl. 174—102 R **22 Claims**



1. In a process for producing a highly expanded polyolefin insulated coaxial cable having excellent high frequency characteristics comprising the steps of feeding a polyolefin, a nucleating agent and a volatile liquid blowing agent to an extruder and heat extruding said mixture through said extruder onto an inner conductor passing through said extruder to cover the outer periphery of said inner conductor thereby forming an insulation layer of a highly expanded polyolefin foam having a foaming ratio in excess of 2.5 times (60% expansion degree), the improvement which includes the step of, after extruding the foaming polyolefin mixture around said inner conductor, sizing the outer surface of said foaming polyolefin layer on said inner conductor by means of a sizing die having a parallel land at normal atmospheric pressure to prevent free foaming in the sizing die and to obtain the highly expanded uniform polyolefin insulation layer while providing tight adhesion of said insulation layer to said inner conductor due to the absence of a space between said foaming material and said inner conductor, which space, if present, would permit free expansion on said foaming material and wherein the temperature of the sizing die is maintained lower than the boiling point of the volatile liquid, said volatile liquid blowing agent being in liquid form and providing a lubricating effect for the foamed material being sized.

22. Highly expanded polyolefin insulated coaxial cable having excellent high frequency characteristics wherein the inner conductor coated with the layer of insulation is produced by a process comprising the steps of feeding a polyolefin, a nucleating agent and a volatile liquid blowing agent to an extruder and heat extruding said mixture through said extruder onto an inner conductor passing through said extruder to cover the outer periphery of said inner conductor, thereby forming an insulation layer of a highly expanded polyolefin foam having a foaming ratio in excess of 2.5 times (60% expansion degree), wherein the improvement includes the step of, after extruding the foaming polyolefin mixture around said inner conductor, sizing the outer surface of said foaming polyolefin layer on said inner conductor by means of a sizing die having a parallel land at normal atmospheric pressure to prevent free foaming in the sizing die to obtain a uniform size of the highly expanded uniform polyolefin insulation layer while providing tight adhesion of said insulation layer to said inner conductor.

4,204,087

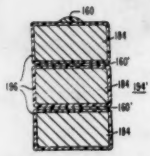
ADHESIVE COATED ELECTRICAL CONDUCTORS

Kou C. Lin, Hickory, and Edmund E. Woods, Sharon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 743,828, Nov. 22, 1976, Pat. No. 4,109,375. This application Apr. 21, 1978, Ser. No. 898,346

Int. Cl.[2] H01B *7/02;* **H01F** *27/30*

U.S. Cl. 174—120 SR **1 Claim**



1. An insulated, bondable electrical conductor, comprising:

an elongated electrical conductor having a plurality of sides which define a substantially rectangular configuration about a longitudinal axis,

a solid infusible, thermoset first coating on all sides of said elongated electrical conductor, said first coating being a resinous tenacious film formed of heat fused, particulated electrical insulation material,

a solid heat fusible adhesive bead on said first coating on a selected side of said electrical conductor which extends in the direction of the longitudinal axis of elongated electrical conductor,

said bead being heat fused, particulated resinous electrical insulation material in the B-stage,

said bead having predetermined width and height dimensions, with the width and height dimensions of said adhesive bead being selected such that the height dimension exceeds the predetermined thickness dimension of said first coating, and the width dimension is less than the width of said selected side, with the amount of material in said bead being such that application of heat and pressure to the bead, when the insulated, bondable electrical conductor is wound upon itself into a coil to form a plurality of adjacent conductor turns with the bead therebetween, will spread the bead material over substantially all of the selected side to a thickness having a dimension which is substantially equal to the predetermined thickness dimension of said first coating.

4,204,088

MEANS FOR ESTABLISHING VARIOUS COMMUNICATION CONDITIONS IN A CRYPTOGRAPHIC SYSTEM

Stephen Janiszewski, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

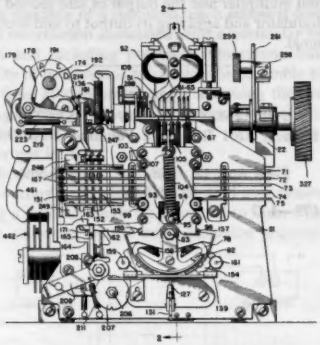
Filed Dec. 20, 1945, Ser. No. 636,217

Int. Cl.[2] H04L *9/00*

U.S. Cl. 178—22 **5 Claims**

4. In a telegraph system, interconnected stations, converters at each station comprising transmitting and receiving apparatus, a signal line connected to said stations, said transmitting apparatus comprising a series of cam controlled transmitting contacts, means for controlling said contacts permutably, and means for altering the control imparted to said contacts by said means, said receiving apparatus comprising a selector mechanism responsive to enciphered signals generated by any transmitting apparatus, and means for retranslating said altered signal to effect printing in correspondence thereto, an electro-

magnetically controlled ciphering device at each station, and pulsing means cyclically operable by said receiving apparatus



for controlling said ciphering device, whereby said altering means is rendered effective.

4,204,089

KEYBOARD METHOD AND APPARATUS FOR ACCENTED CHARACTERS

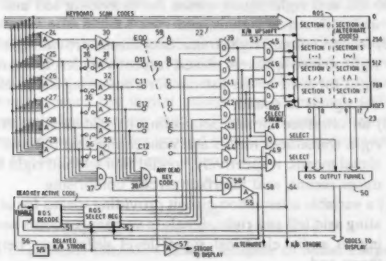
Brian D. Key, Winchester; James Smith, Southampton, and Shaun C. Kerigan, Harestock, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1978, Ser. No. 961,081

Claims priority, application United Kingdom, Dec. 16, 1977, 52383/77

Int. Cl.² G06F *3/14;* H04L *13/08*

U.S. Cl. 178—30 **7 Claims**



1. Keyboard apparatus comprising:

a keyboard including at least one dead-key, each said dead-key being associated with a given type of character accent;

a storage means having a plurality of sections, one section thereof containing character codes representing a character set, each of the other sections thereof containing character code sets representing characters accented with accent marks of a type associated with each said other section;

means for providing coded signals indicative of the positions of said keys which have been selected;

means responsive to a coded signal indicative of selection of a non-dead-key for accessing said storage means to read therefrom a character code associated with that key and forming part of said character set;

means responsive to a coded signal indicative of selection of a dead-key for accessing said storage means to obtain an address of the section of said storage means containing character code sets representing characters accented with the accent marks associated with said dead-key; and

means responsive to a signal indicative of selection of a non-dead-key following an immediately preceding signal indicative of selection of a dead-key for accessing the section of said storage means having said obtained address, thereby enabling the reading from said storage means of a character code representing a character accented with the accent marks associated with said dead-key represented by said preceding signal.

4,204,090

PROCESS AND AN ARRANGEMENT FOR REDUCING THE REDUNDANCY OF BINARY CHARACTER SEQUENCES WHICH DESCRIBE CHARACTERS OR GRAPHIC PATTERNS

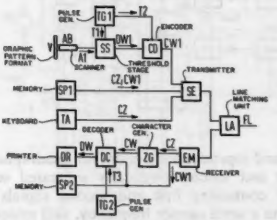
Joachim Heinzl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 942,916

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748289

Int. Cl.² G11C *17/00;* H04L *13/08;* H04N *5/78*

U.S. Cl. 178—30 **9 Claims**



1. A process for reducing the redundancy of binary character sequences which describe information including characters and graphic patterns represented in punctiform fashion, wherein within the binary character sequences each binary character having a first binary value is assigned to a point which is to be represented and at least one interval corresponding to one printing element is provided between two points represented by the same output component, wherein each element is divided into a plurality of sub-elements, and wherein the binary character sequences represent the information divided into sub-elements, the improvement therein comprising the steps of:

generating and assigning code words such that of the possible combinations of a group of binary characters of the binary code sequences the code words are assigned to those combinations in which a binary character having a first binary value is followed by at least one predetermined number of binary characters having a second binary value, the predetermined number being dependent on the number of sub-elements within a printing element;

transmitting the code words, in place of the binary character sequences, to a receiver;

receiving the transmitted code words;

reassigning the original binary character sequences to the received code words; and

feeding the binary character sequences to operate output components.

4,204,091

CANCELLATION OF INTERFERENCE DISTORTIONS CAUSED BY INTERMODULATION BETWEEN FM SIGNALS ON ADJACENT CHANNELS

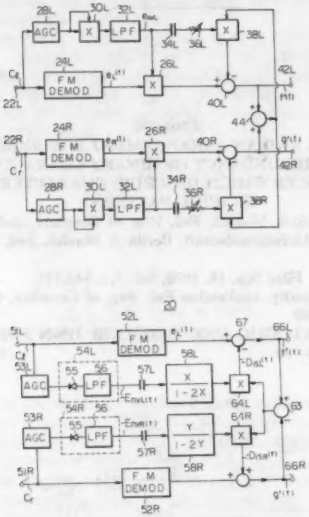
Yukinobu Ishigaki, and Teruo Muraoka, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Mar. 17, 1978, Ser. No. 887,813

Claims priority, application Japan, Mar. 21, 1977, 52/30839; Apr. 19, 1977, 52/44840

Int. Cl.² H04H 5/00

U.S. Cl. 179—1 GB **14 Claims**



1. In a sound reproduction system for quadraphonic records having first and second physically separated sound tracks respectively containing first and second signals frequency-modulated on a same carrier frequency, said system including first and second channels including first and second frequency demodulators for demodulating said first and second frequency-modulated signals respectively and crosstalk paths between said first and second channels to produce an interference distortion in each of said frequency-modulated signals, apparatus for cancelling said interference distortion comprising:

first and second input terminals to which said first and second frequency-modulated signals are respectively applied;

first and second output terminals from which first and second distortionless frequency-demodulated signals are delivered;

first and second means connected to said first and second input terminals respectively for detecting the envelopes of said first and second frequency-modulated signals;

first and second means for eliminating the DC components of the detected envelopes respectively and varying the magnitude of said DC-eliminated envelopes; and

first and second closed-loop feedback circuits cross-coupled between said first and second output terminals including a common arithmetic circuit having its input terminals connected to said first and second output terminals, said first feedback circuit including a first multiplier for providing multiplication of the output of said common arithmetic circuit and the output from said first magnitude-varying means and a second arithmetic circuit for combining the output of said first multiplier and the output of said first frequency demodulator and applying its output to said first output terminal, and said second feedback circuit including a second multiplier for providing multiplication of the output of said common arithmetic circuit and the output from said second magnitude-varying means and a third arithmetic circuit for combining the output of said second multiplier and the output of said second frequency demodulator and applying its output to said second output terminal.

4,204,092

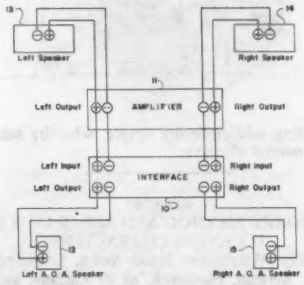
AUDIO IMAGE RECOVERY SYSTEM

Paul F. Bruney, 3201 Rue Park Fontaine, New Orleans, La. 70114

Filed Apr. 11, 1978, Ser. No. 895,309

Int. Cl.² H04R 5/04

U.S. Cl. 179—1 G **6 Claims**



2. An audio-image system for use by a listener comprising:

(a) first left and right transducer means providing left and right speakers spaced and laterally placed respectively on the sides of the listener for converting audio electrical signals to sound;

(b) left and right signal means for providing left and right audio electrical signals; and

(c) second left and right transducer means providing left and right spaced speakers placed respectively left forward and right forward of the listener for converting audio electrical signals to sound;

(d) an interface circuit connecting to said second left and right transducer means and connecting said left and right signal means, respectively, to said first left and right transducer means; said interface circuit comprising

(1) a variable attenuation circuit providing means for attenuating said left and right signals in varying amounts according to audio electrical signal level differences between them; and

(2) left and right feed circuits providing means for feeding said left and right variably attenuated signals to said left and right transducer means at selectively variable levels, respectively.

4,204,093

VARIABLE FRAME RATE TECHNIQUE FOR USE IN A TIME-DIVISION MULTIPLE ACCESS (TDMA) COMMUNICATION SYSTEM

Yu Shuan Yeh, Freehold Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1978, Ser. No. 907,795

Int. Cl.² H04J 3/16

U.S. Cl. 370—95 **13 Claims**

1. A method of providing efficient access in a communication system between at least one transmitter disposed in a first ground area and a plurality of receiving stations having a plurality of different communication traffic requirements disposed in a second remote ground area, the method comprising the steps of:

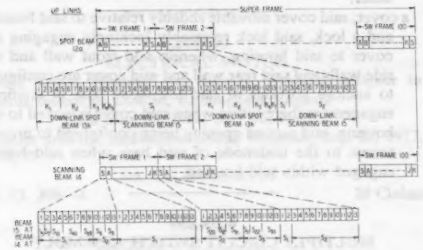
(a) transmitting information destined for the plurality of receiving stations in a transmission burst; and

(b) in performing step (a), transmitting in each transmission burst a plurality of q subbursts, each subburst comprising digital information associated with a particular receiving station and including preamble information bits and a plurality of information bits where the preamble bits comprise, inter alia, information for accessing the proper receiving station to receive and process the included information bits,

characterized in that

the method comprises the further steps of:

(c) transmitting a plurality of s sequential transmission bursts during a predetermined time interval to form a communication sequence which communication sequence is sequentially repeated, each communication sequence being capable of providing q·s one-way transmission channels between the first and second ground areas; and



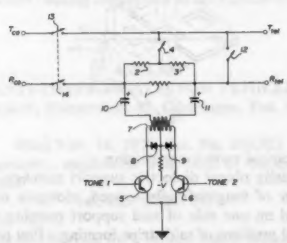
(d) transmitting within n assigned subbursts in each transmission burst of the communication sequence the digital information associated with n·s transmission channels required between the at least one transmitter in the first ground area and a receiving station in the second ground area when n is an integer while transmitting within each of m assigned subbursts spaced at preselected intervals throughout the s transmission bursts of the communication sequence the digital information associated with m transmission channels required between said at least one transmitter in the first ground area and a receiving station in the second group area when $m < s$.

4,204,094

TONE APPLYING LINE CIRCUIT

Jacob Cepelinski, Ottawa, Canada, assignor to Mitel Corporation, Canada

Filed Aug. 14, 1978, Ser. No. 933,538
Claims priority, application Canada, May 24, 1978, 303989
Int. Cl.[2] H04Q 1/44
U.S. Cl. 179—18 FA **8 Claims**



8. In a line circuit comprising a tip lead and a ring lead having one end for connection to a central office and another end for connection to a subscriber's telephone set, a tone applying arrangement comprising

a signal source having an output impedance which is low relative to the off-hook impedance of the subscriber's telephone set including line current conducting means connected in series with the tip or ring lead,

a pair of resistors connected in series across the low impedance source, and

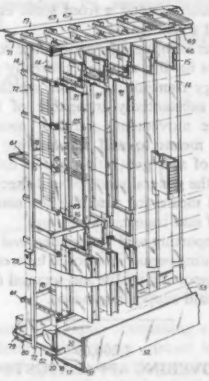
a switch means connected between the junction of the pair of resistors and the other of the tip or ring lead.

4,204,095

TELEPHONE MAIN DISTRIBUTING FRAME

Paul V. De Luca, Port Washington, N.Y., and Charles L. Gautier, Warren, N.J., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,098
Int. Cl.[2] H04Q 1/14
U.S. Cl. 179—98 **3 Claims**



1. Improved telephone main distributing frame construction comprising: a plurality of vertical planar elements positioned in mutually parallel relation to define first generally rearward and second generally forward vertical coplanar edges, and an elongated interstice between pairs of adjacent elements; a plurality of jumper rings interconnected to at least one of each of said pair of adjacent elements, said rings lying substantially in a horizontal plane to accommodate generally vertically arranged jumper connectors passing therethrough; means for mounting connector blocks in generally vertical orientation on said forward edges of said planar elements; a plurality of generally horizontally arranged trough-forming elements mounted upon said planar elements at said forward edges, including a first trough-forming element adjacent an upper end of said planar elements, a second generally medially positioned trough-forming element, and a third trough-forming element positioned substantially at the lower end of said forward edges of said planar elements; whereby horizontal jumpering connections between connector blocks may be formed substantially adjacent the plane of said forward edges of said planar elements, and vertical jumpering connections may be formed within said interstices between adjacent planar elements.

4,204,096

SONIC TRANSDUCER MOUNTING

Lester M. Barcus, 16226 Wayfarer La., Huntington Beach, Calif. 92649, and John F. Berry, 3392 St. Albans Dr., Los Alamitos, Calif. 90720

Continuation of Ser. No. 820,314, Jul. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 528,671, Dec. 2, 1974, Pat. No. 4,048,454. This application Aug. 4, 1978, Ser. No. 930,997

Int. Cl.[2] H04R *1/02*

U.S. Cl. 179—146 R **15 Claims**

1. A sonic transducer system for transmitting sonic signals in a medium comprising:

a sonic transducer which is sheet-like and rigid and substantially incapable of flexural and diaphragm-like movement, said transducer having a front sonic energy-transmitting surface and a rear surface,

said transducer comprising piezoelectric sonic energy generating means having opposed generally planar electrodes, sonic energy transmitting means which is sheet-like and rigid and substantially incapable of flexural and diaphragm-like movement, coupling means coupling said generating means to said transmitting means with said electrodes of said generating means oriented principally parallel to the general plane of said sheet-like transmitting means, and means for damping the natural resonant frequencies of said transmitting means,

means for supporting said transducer, and

resilient mounting means interposed between said transducer and said supporting means and secured to both said transducer and said supporting means.

4,204,097

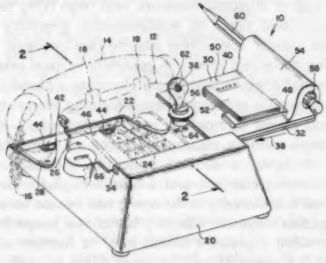
LOCKABLE COVERING APPARATUS FOR TELEPHONE DIALS

John W. Schmit, 1858 N. Natoma Ave., Chicago, Ill. 60635

Continuation of Ser. No. 772,089, Feb. 25, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 924,096

Int. Cl.[2] H04M *1/66*

U.S. Cl. 179—189 D **5 Claims**



1. A telephone dial shielding device for selectively permitting or preventing access to the dialing area of a telephone base comprising

a housing, said housing including a front wall and a rearwall and side walls, said housing having a first opening and a second opening therein, said housing covering portions of a base of a telephone, said first opening having a first portion and a second portion, the hand held portion of the telephone being disposed outwardly of said housing, said first portion of said first opening being located adjacent the receptacle portions of said telephone base in which said hand held portion thereof resides when stored, said second opening being located adjacent the underside of said base, said second portion of said first opening being located adjacent the dialing area of said telephone base, said first portion of said first opening and said second portion of said first opening communicating with each other,

a cover, said cover movable slidably relative to said housing, and a lock, said lock releasably lockingly engaging said cover to said housing, wherein said front wall and said side walls and said rear wall and said cover are configured to enclose portions of said telephone base in confining engagement therewithin when said cover is locked to said housing, said second opening being configured to provide access to the underside of said base when said base is engaged within said housing.

4,204,098

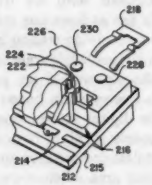
MULTIPLE CIRCUIT SWITCH ASSEMBLY

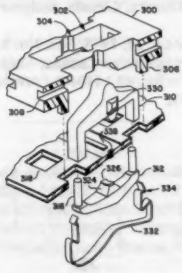
Edward J. Strande, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 667,736, Mar. 17, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 772,185

Int. Cl.[2] H01H *9/00*

U.S. Cl. 200—1 R **4 Claims**





1. An electrical switch comprising

a substantially planar dielectric support member,

a first pair of longitudinally spaced, elongate metal strips disposed on one side of said support member with adjacent end portions of said strips forming a first pair of fixed electrical contacts,

a second pair of longitudinally spaced, elongate metal strips disposed on the other side of said support member, with

adjacent end portions of said second pair of strips forming a second pair of fixed electrical contacts,

switch actuator means comprising a carrier for a pair of movable electrical contacts, said carrier including first and second portions of an elastomeric material, said movable contacts consisting of a third pair of elongate metal strips, each one bonded to a different portion of said elastomeric material, and

means mounting said carrier on said support member, said mounting means being configured to position each movable contact opposite a different pair of fixed contacts,

said actuator means further comprising means biasing one of said movable contacts into engagement with the fixed contacts disposed opposite it, actuation of said switch causing said one of the movable contacts to disengage, and the other to engage, the fixed contacts disposed opposite them in the switch.

4,204,099

ELECTRICAL SWITCH

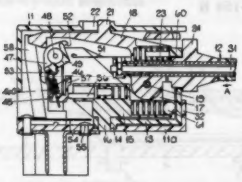
Edward Cryer, Higham, Nr. Burnley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 30, 1978, Ser. No. 910,336

Claims priority, application United Kingdom, Sep. 13, 1977, 38046/77

Int. Cl.² H01H *25/06*

U.S. Cl. 200—4 **20 Claims**



1. An electrical switch including a body, an operating lever extending from the body and movable relative thereto at least in part, in two different directional modes, a contact carrier supported on the body for movement relative thereto in a first plane between first and second positions, a movable contact member supported by said carrier for movement relative to the carrier between first and second positions, first and second fixed electrical contacts engageable by said movable contact member in the first position of the movable contact member while the contact carrier is in its first position, and third and fourth fixed electrical contacts spaced from said first and second fixed electrical contacts in the direction of movement of the contact carrier and engageable by said movable contact member in the first position of the movable contact member relative to the carrier while the carrier is in its second position, movement of the lever or said part thereof in one of said modes causing movement of the movable contact member relative to the contact carrier and movement of the lever in the other of said two modes causing movement of the carrier relative to the body.

4,204,100

ANTI-THEFT SWITCH FOR VEHICLES

Dieter Reichert, Bismarckstr.49, Gartringen, Fed. Rep. of Germany

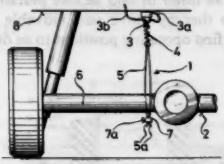
Filed Nov. 14, 1977, Ser. No. 850,931

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655660

Int. Cl.² H01H *3/16*

U.S. Cl. 200—52 R **6 Claims**

1. An anti-theft device for a vehicle that is movably mounted on wheel carriers, for securing the vehicle against theft of wheels and against unauthorized towing, comprising an alarm switch and an actuating member, one of which is mounted in a fixed position relative to the vehicle, and the other of which is mounted to move with one of said wheel carriers, a pre-loaded resilient member connecting the switch and the actuating member, the actuating member defining a lost motion limit to accommodate normal relative movement of said vehicle and said wheel carrier during travel of the vehicle without actuating the switch, and said switch being actuated through the pre-loaded resilient member by relative motion of said switch and said actuating member in excess of said lost motion limit when said vehicle is raised for towing or removal of a wheel, said resilient member being adapted to yield to accommodate relative movement of said vehicle and wheel carrier in excess of said relative motion needed to actuate the switch.



4,204,101

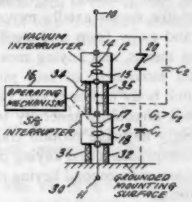
HYBRID CIRCUIT BREAKER WITH VARISTOR IN PARALLEL WITH VACUUM INTERRUPTER

Rolf Dethlefsen, Greensburg, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 22, 1977, Ser. No. 808,811

Int. Cl.² H01N *33/16*

U.S. Cl. 200—144 AP **11 Claims**



1. A hybrid circuit interrupter comprising a vacuum circuit interrupter, an electronegative gas circuit interrupter connected in series with said vacuum interrupter, an operating mechanism for simultaneously opening said vacuum circuit interrupter and electronegative gas circuit interrupter, and a varistor connected in parallel with said vacuum interrupter.

4,204,102

ELECTRICAL SWITCH

David W. Bull, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.

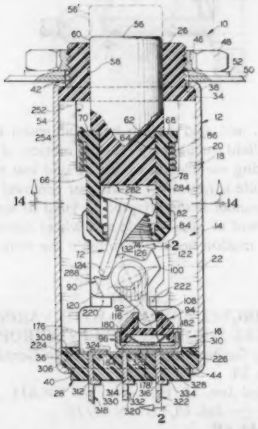
Filed Dec. 16, 1977, Ser. No. 861,436

Int. Cl.² H01H *3/12, 3/14, 13/64*

U.S. Cl. 200—153 J **32 Claims**

1. An electrical switch assembly, comprising switch body means, chamber means formed generally internally of said switch body means, a plurality of stationary electrical contacts disposed within said chamber means, linearly movable contact means slidably movable to a first plurality of operating positions and engageable with said plurality of stationary electrical contacts, oscillatingly movable motion transmitting means carried within said chamber means and movable to a second plurality of operating positions, said oscillatingly movable motion transmitting means being operatively connected to said movable contact means, manually movable actuator means carried by said switch body means and movable relative

thereto, resiliently deflectable motion transmitting means operatively carried by said manually movable actuator means and effective for operatively engaging said oscillatingly movable motion transmitting means, said resiliently deflectable motion transmitting means being effective upon actuation of said movable actuator means to move said oscillatingly movable motion transmitting means from one of said second plurality of operating positions to an other of said second plurality of operating positions and to thereby move said movable contact means from one of said first operating positions to an other of said first



operating positions, said manually movable actuator means comprising plunger-like means axially movable in directions generally toward and away from said oscillatingly movable motion transmitting means, and keying means for the otherwise free rotational movement of said plunger-like means relative to said switch body means as said plunger-like means moves axially in said directions generally toward and away from said oscillatingly movable motion transmitting means, said keying means comprising a first keying portion carried by said plunger-like means and a second keying portion carried by said switch body means.

4,204,103

DRIVING APPARATUS FOR ELECTRIC POWER CIRCUIT BREAKERS

Siegfried Jährig, and Reinhard Liebig, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

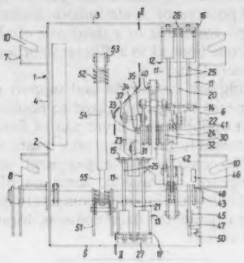
Filed Sep. 20, 1978, Ser. No. 943,926

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742772

Int. Cl.[2] H01H *5/10*

U.S. Cl. 200—153 SC **5 Claims**

1. A driving apparatus for electric power circuit breakers comprising a shaft adapted for latching in a cocked condition, two crank arms axially spaced apart on the shaft and projecting oppositely 180° therefrom, each arm being coupled to a separate group of parallel-connected coil springs, a device for cocking the coil springs mounted on the shaft between the crank arms, means for taking the power output from one of the



crank arms, and means on either side of the cocking device for supporting the shaft.

4,204,104

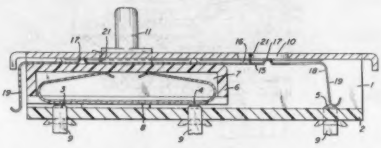
SLIDE SWITCH

Thomas J. Quigley, Farmville, Va., assignor to Stackpole Components Company, Raleigh, N.C.

Filed Oct. 30, 1978, Ser. No. 956,177

Int. Cl.[2] H01H *1/44, 9/00, 15/24*

U.S. Cl. 200—164 R **8 Claims**



1. A slide switch comprising an elongated case formed from a metal housing provided in one side with a longitudinal slot and also provided with an insulating base, a row of three fixed electric contacts inside the case spaced apart lengthwise of said base and rigidly mounted thereon, an insulating slider inside the case provided with an actuating button extending through said slot for moving the slider back and forth in the case, a bridging contact movable by the slider from a position bridging the middle stationary contact and either of the end stationary contacts to a position bridging the middle contact and the other end contact, and a metal grounding contact in the case in engagement with said housing and movable by the slider into engagement with one end contact when the bridging contact is moved into engagement with the other end contact, said grounding contact being longer than the slider and having an abutment at each side of said button in its path of movement, and the distance between said abutments being such that when the button is moved toward said other end contact a predetermined distance it will engage one of said abutments and then push it in the same direction far enough to pull said grounding contact into engagement with said one end contact at the opposite end of the case, whereby the end contact engaged by the grounding contact is electrically connected by it to said metal housing.

4,204,105

MICROWAVE ENERGY MODERATING BAG

Algis S. Leveckis, Ludlow, Ky., and Stephanie S. Gelman, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

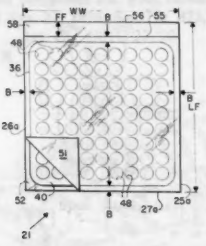
Filed Apr. 14, 1978, Ser. No. 896,421

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 E **4 Claims**

1. In an improved microwave energy moderating cooking

bag for enclosing foodstuff to be warmed or cooked uniformly in a microwave oven and which bag includes microwave energy moderating wall portions comprising perforated electrically conductive sheet material having perimetrical edges, said conductive sheet material being substantially fully perforated with a multiplicity of apertures of predetermined sizes



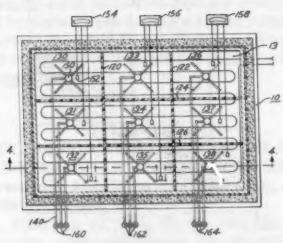
with respect to a predetermined nominal frequency of microwave energy, the improvement wherein said electrically conductive sheet material is so configured and disposed that adjacent side-by-side segments of said perimetrical edges are sufficiently offset with respect to each other that edge-to-edge electric field relations are substantially obviated intermediate said adjacent side-by-side segments.

4,204,106

ELECTRICAL HEATING SYSTEM FOR BUILDING STRUCTURES

Jerrold L. Colten, South Bend, Ind., assignor to Bristol Products, Inc., Bristol, Ind.

Filed Jan. 8, 1979, Ser. No. 1,863
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—213 **14 Claims**



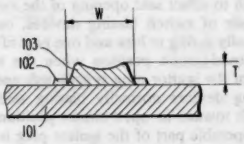
1. A heating system for building structures, comprising side walls defining an inner area with earth disposed beneath said area and supporting said side walls, heat absorbing and releasing fill material substantially filling said area and having an upper surface, means for sensing the amount of moisture in said fill material, a water distribution means disposed in said fill material, a line connecting said water distribution means to a source of water, a slab forming a floor of the building structure supported by said fill material on said upper surface forming a heat exchanging relationship with said fill material, and an electrical heating cable in thermal communication with said fill material for heating said fill material.

4,204,107

THICK-FILM THERMAL PRINTING HEAD AND METHOD OF MANUFACTURING THE SAME

Toshio Ohkubo; Yuji Kajiwara, and Tsutomu Itano, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,258
Claims priority, application Japan, May 31, 1977, 52/64313
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—216 **5 Claims**



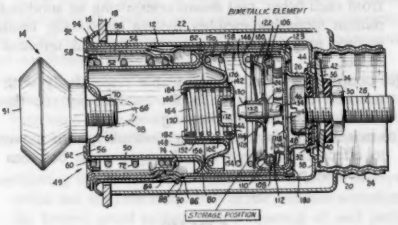
1. A thermal printing head comprising: an insulative substrate, a pair of first and second conductive layers disposed on said substrate and having inner ends spaced from each other, and a resistive layer disposed on said substrate, extending between said first and second conductive layers, and electrically connected with said inner ends of said conductive layer so as to provide an electrical current path between said inner ends of said conductive layers, said resistive layer having a central portion extending along said electrical current path which is thinner than the edge portions of said resistive layer extending along said electrical current path so that the surface of said resistive layer is concave in a direction substantially perpendicular to said electrical current path whereby electrical current passing through said resistive layer produces a temperature rise over a wide area of the top surface of said resistive layer to transfer heat to a thermally sensitive recording medium in contact with said resistive layer.

4,204,108

MANUAL ELECTRIC CIGAR LIGHTER

Laurence G. Horwitt, New Haven, and Donald J. Mattis, Norwalk, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Jan. 12, 1978, Ser. No. 868,935
Int. Cl.[2] F23Q 7/24
U.S. Cl. 219—265 **26 Claims**



1. A manual cigar lighter, comprising in combination:
(a) a holder device including a socket having two contacts forming part of a cigar lighter circuit,
(b) an ignitor plug receivable in the socket, said plug having a manually operable part,
(c) a heating element carried at the inner end of the plug,
(d) means for establishing a circuit from the holder device contacts through the heating element, said means including an electrical switch having cooperable parts carried by the ignitor plug, one of said switch parts having an open circuit position, and a closed-circuit position,
(e) means for closing said switch and energizing said heating

element in response to actuation of said manually operable part,

(f) means responsive to heating of said heating element, for opening said switch to de-energize the element, said means including a bimetallic member carried by said plug and which always normally has a first position when cold and a second position when sufficiently heated, said member having a bimetallic actuator portion which is free and clear of attachment to any other parts, said actuator portion being adapted for abutting engagement, when in its second position, with one of the cooperable parts of said switch to effect said opening of the switch, and

(g) a pair of switch biasing devices, one of said devices normally acting to bias said one part of the switch toward its closed-circuit position when the manually operable part of the ignitor plug is actuated, and the other of said biasing devices normally biasing said one part of the switch toward its open circuit position, when the manually operable part of the ignitor plug is released.

4,204,109

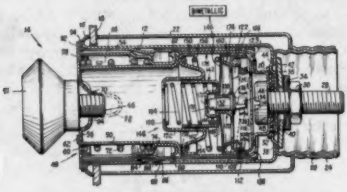
AUTOMATIC ELECTRIC CIGAR LIGHTER

Laurence G. Horwitt, New Haven, and Donald J. Mattis, Norwalk, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Division of Ser. No. 841,836, Oct. 13, 1977, Pat. No. 4,168,422. This application Sep. 14, 1978, Ser. No. 942,359

Int. Cl.[2] F23Q *7/22*

U.S. Cl. 219—265 **12 Claims**



1. A cigar lighter igniting unit, comprising in combination:

(a) an electrical resistance heating coil having electrical terminal elements constituting electrical contacts,

(b) metallic means simultaneously mechanically securing said terminal elements in spaced-apart relation to constitute a unitary assemblage and insulating said elements from each other, said means comprising an anodized aluminum mounting member having electrically insulating surface areas directly engaged with said terminal elements,

(c) cooperable contacts engageable respectively with said terminal element contacts for establishing the flow of electricity through the heating coil, and

(d) means mounting said unitary assemblage for movement to effect engagement and disengagement between said respective pairs of contacts.

4,204,110

DECORATIVE PERSONAL ELECTRIC HEATING APPLIANCE

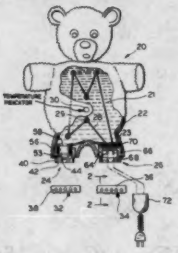
Helen E. Smit, and Julie A. Smit, both of 1045 Hinman Ave., Evanston, Ill. 60202

Filed Mar. 7, 1977, Ser. No. 774,958

Int. Cl.[2] H05B *1/00*; A61F *7/04*

U.S. Cl. 219—313 **13 Claims**

1. A decorative personal heating appliance comprising means defining a decorative exterior covering enclosing an internal fluid-containing bladder having a fill opening therein, electric heater means inside said bladder for heating the fluid contained therein, electrical connector means associated with said electric heater means and extending from said bladder means into a first open recess in said decorative covering for enabling an external power source to be connected to said heater means, whereby said power source may be disconnected from said heater means while said appliance is in use, detachable electrical connection means for applying energy from an external power source via said connector means to said heater means, means comprising a removable stopper for



controlling said opening and for enabling a filling or emptying of said bladder via said opening, said opening and stopper being positioned in a second open recess in said decorative exterior covering, and removable child-proof cap means camouflaged to blend in with said exterior covering for closing each of said open recesses for concealing said stopper means and said connector means.

4,204,111

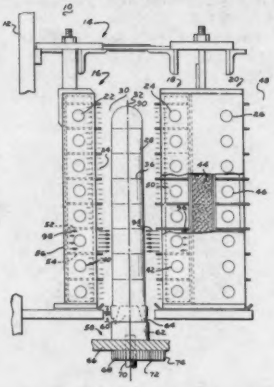
HEATING IMPROVEMENTS IN A PREFORM REHEAT SYSTEM

Jon D. Yonko, Dayton, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 19, 1977, Ser. No. 843,565

Int. Cl.[2] H05B *1/00*; F27B *9/06*; B29C *17/07*

U.S. Cl. 219—411 **13 Claims**



1. In the process of raising elongated thermoplastic preforms to molding temperature which includes programming heat into predetermined vertical zones of advancing preforms rotating about their axes from vertically adjacent heaters at different temperatures extending longitudinally of such axes,

the improvement therein comprising, in combination:

preventing heat waves emanating from one heater toward an oppositely disposed zone of a preform from overlapping into an area through which waves are issuing from a next adjacent heater; and

reflecting heat waves emitted from the back sides of a pair of

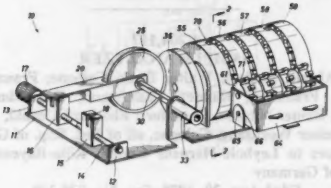
directly oppositely disposed heaters away from the preform zone interposed between said pair back toward such just-mentioned zone through use of vertically disposed reflectors situated adjacent the back sides of said pair.

4,204,112

BIDIRECTIONAL PRESETTABLE ODOMETER

Don W. Lane, 4501 Telephone Rd. #33, Houston, Tex. 77087

Filed Jan. 27, 1978, Ser. No. 873,084
Int. Cl.[2] G01C *22/00*
U.S. Cl. 235—95 R **8 Claims**



1. Apparatus which functions as a trip measuring device cooperative with a speedometer cable which rotates at a speed proportionate to vehicle speed which comprises:

(a) a supportive framework for the apparatus;

(b) input means supported by said framework which input means is adapted to be rotated by a speedometer cable at a speed proportionate to vehicle speed;

(c) multiplying means connected to said input means for multiplying the input rotation received at said input means by a scale factor input to said multiplying means, said multiplying means adjustable between specified minimum and maximum scale factors;

(d) a multi-decade indicator means driven by said multiplying means, said indicator means being selectively adjustable to a desired beginning value visually indicated by said indicator means; and

(e) control means for controllably operating said indicator means to increment in ascending or descending order as required by rotation of the speedometer cable to said input means which control means comprises a drive system operatively connected between said multiplying means and said indicator means wherein positive and negative scale factors input to said multiplying means are implemented by variably positioning a driven member relative to a driving member to selectively achieve rotational reversal of the driven member dependent on the polarity of the scale factor.

4,204,113

SYSTEM FOR KEEPING ACCOUNT OF PREDETERMINED HOMOGENOUS UNITS

Georges Giraud, and Jean H. Mollier, both of 20, rue Dieumegard, 93406 Saint-Ouen, France

Filed Sep. 12, 1978, Ser. No. 941,733
Claims priority, application France, Sep. 16, 1977, 77 28049
Int. Cl.[2] G06F *15/20*; G06K *5/00, 19/06*
U.S. Cl. 235—375 **18 Claims**

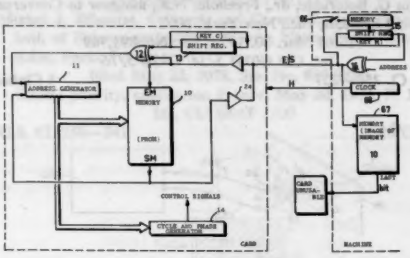
1. A system for keeping account of predetermined homogeneous units, which comprises:

an information-carrying article including a memory for storing information and circuits for controlling said memory;

an external device for operating on information stored in said article memory; and

means for coupling said article and said external device for the exchange of data;

said article memory including a validating field accessible by said external device, said validating field having a plurality of information bits, and said article memory further including a plurality of zones corresponding to said information bits of said validating field, each of said informa-



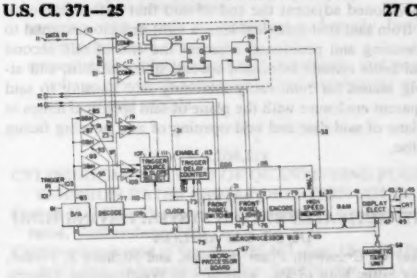
tion bits indicating whether the corresponding zone is validated.

4,204,114

METHOD AND APPARATUS FOR COMPARING LOGIC FUNCTIONS BY ACQUIRING SIGNALS ONE AT A TIME FROM CIRCUIT NODES

William E. Shoemaker, Los Altos, and David W. Wilson, San Jose, both of Calif., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 24, 1978, Ser. No. 880,876
Int. Cl.[2] G06F *11/06*; G01R *15/12*
U.S. Cl. 371—25 **27 Claims**



1. A method of testing a logic system having a common clock oscillator and which has a plurality of nodes wherein the logic signal at each node is in synchronism with said common clock oscillator, comprising the steps of:

recording in sequence as reference signals from a known good system (a) a periodic waveform that has a specific frequency ratio to the system common clock oscillator output, and (b) the logic signal at each of a plurality of nodes,

comparing the frequency of a periodic waveform of a system under test with the frequency of the periodic waveform of the known good system, the frequency of said periodic waveform of the system under test having said specific frequency ratio to a clock oscillator output of the system under test,

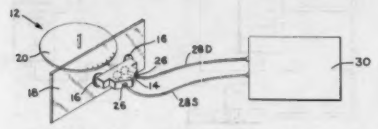
deriving from the recorded signals a set of reference signals that are modified in frequency in proportion to the ratio of the periodic waveform frequencies of the known good system and the system under test, whereby compensation is provided for the effect of different clock oscillator frequencies, and

comparing signals from a plurality of nodes of the system under test with corresponding modified reference signals, whereby the performance of the system under test is determined.

4,204,115
REMOVABLY ATTACHABLE WATT-HOUR METER MONITOR DEVICE

Austin G. Boldridge, Jr., Freehold, N.J., assignor to Conversational Systems, Inc., New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,789
Int. Cl.[2] G01D *5/34*; G02B *5/16*
U.S. Cl. 250—227 **4 Claims**

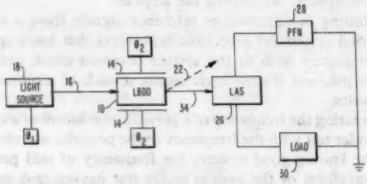


1. Apparatus for indicating the rotation of a disc having an indicator mark on its periphery, said disc being positioned within a transparent enclosure, said apparatus comprising a housing, said housing having a centerline and an opening in the region of said centerline, first and second spherical lenses, means for positioning within said housing said spherical lens symmetrically on opposite sides of said centerline with first portions thereof facing said opening, first and second fibre optical cables extending into said housing, each of said cables being positioned adjacent second portions of said first and second spherical lenses, respectively, said second portions being on diameters of the respective spherical lenses and opposite said first portions, a light source external to said housing and positioned adjacent the end of said first optical cable remote from said first spherical lens, a light detector external to said housing and positioned adjacent the end of said second optical cable remote from said second spherical lens, and attaching means for removably attaching said housing to said transparent enclosure with the plane of said spherical lenses in the plane of said disc and said opening of said housing facing said disc.

4,204,116
LIGHT ACTIVATED SWITCH SYSTEM HAVING HIGH DI/DT CAPABILITY

Michael W. Cresswell, Plum Borough, and Richard J. Fiedor, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 24, 1978, Ser. No. 927,441
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—229 **6 Claims**

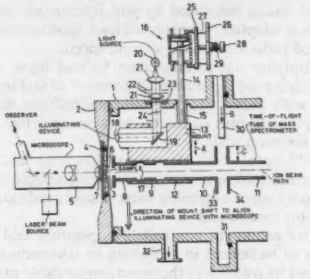


6. A light activated switch system comprising:
(a) a pulse forming circuit including:
a power supply;
a ladder network including at least one capacitor coupled to at least one inductor;
switch means for coupling said power supply and said ladder network in response to a first signal for generating a current in said network;
(b) a load;
(c) means for producing an incandescent light in response to a second signal, said incandescent light having a rise period;
(d) a light activated semiconductor controlled rectifier between said load and said pulse forming circuit responsive to said incandescent light for delivering said current to said load, said rectifier having a switching time characteristic;
(e) deflecting means between said incandescent light and said rectifier remotely controllable for directing said incandescent light onto said rectifier at a specified time in the rise period of said incandescent light in response to a third signal for decreasing the switching time characteristic of said light activated switch.

4,204,117
SAMPLE ANALYZER

Lothar Aberle, Sindorf; Walter Bank, Cologne; Franz Hillenkamp, Frankfurt; Raimund Kaufmann, Dusseldorf-Meerbusch; Rainer Nitsche, Frankfurt; Eberhard Unsöld, Munich, and Reiner Wechsung, Cologne, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Köln-Bayental, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,329
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739828
Int. Cl.[2] B01D *59/44*
U.S. Cl. 250—287 **12 Claims**



1. In a sample analyzer including a microscope for focusing an electromagnetic radiation on the sample to cause ion emission therefrom and visually observing the sample; a mass spectrometer for the mass analysis of the emitted ions; an illuminating means for lighting the sample for the microscopic visual observation thereof; the improvement comprising
(a) an ion optical system for directing ions emitted by the sample into the mass spectrometer;
(b) displaceably supported carrier means carrying said ion optical system and at least one part of said illuminating means; said carrier means having a first position in which said ion optical system is in an operating position in alignment with the sample and a second position in which said illuminating means is in an operating position in alignment with the sample; and
(c) actuating means for selectively moving said carrier means into said positions in a direction generally perpendicular to the axis of said ion optical system.

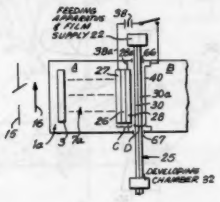
4,204,118
APPARATUS FOR PRODUCING X-RAY IMAGES BY ELECTRICAL CHARGES

Edward E. Sheldon, 30 E. 40 St., New York, N.Y. 10016

Filed Jun. 3, 1977, Ser. No. 803,130
Int. Cl.[2] G01D *9/00*; G03G *13/00, 15/00*; H01J *31/50*
U.S. Cl. 250—315.2 **9 Claims**

1. A device comprising in combination a vacuum tube comprising photocathode means for receiving image produced by

radiation and converting said radiation image into a beam of electrons having the pattern of said image, a first image producing composite screen, said screen receiving said beam of electrons and comprising an electrically conducting layer transmitting said electrons and a layer which in response to the impingement by said electron beam produces electron bombardment induced electrical conductivity changes having the pattern corresponding to said electron beam, and a second image producing screen, said first screen mounted within said



tube, connected to at least one wall of said tube and being stationary in relation to said tube, at least one of said first and second screen having uniform electrical charges deposited on its surface, said conductivity changes in said first screen converting said uniform electrical charges into a pattern of electrical charges corresponding to said radiation image, and said second screen movable and adapted to travel into said vacuum tube and to travel away from said tube carrying said pattern of electrical charges thereon.

4,204,119

METHOD OF READING THERMOLUMINESCENT DOSIMETER

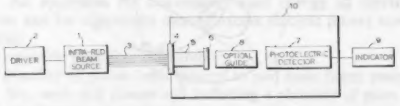
Yoshitake Yasuno, Kyoto; Masafumi Watari, Moriguchi; Hiroshi Tsutsui; Masaru Ikedo, both of Neyagawa, and Osamu Yamamoto, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 21, 1977, Ser. No. 835,341

Claims priority, application Japan, Sep. 22, 1976, 51-113926; Sep. 22, 1976, 51-113932

Int. Cl.[2] G01T *1/11*

U.S. Cl. 250—337 **6 Claims**



1. A thermoluminescent dosimeter for use in a system wherein the dosimeter is exposed to radiation and is then heated to a temperature for production of thermoluminescence by irradiation with infrared rays, said dosimeter comprising:

a substrate having a pair of opposed main sides;

a thermoluminescent material layer disposed on one main side of said substrate; and

an infrared ray absorbing layer disposed on the other main side of said substrate.

4,204,120

PROCESS AND APPARATUS FOR THE MEASUREMENT OF THE FACTOR OF INFRA-RED ABSORPTION OR EMISSION OF MATERIALS

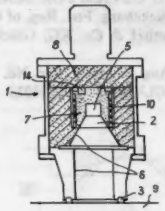
Michel J. Riboulet, Calmont, and Gerard R. Segui, Toulouse, both of France, assignors to Centre National d'Etudes Spatiales, Paris, France

Filed May 22, 1978, Ser. No. 908,021

Claims priority, application France, May 20, 1977, 77 15497

Int. Cl.[2] G01T *1/00*

U.S. Cl. 250—341 **10 Claims**



1. A method of measuring the infra-red radiation absorptivity or emissivity factor of a sample which is at ambient temperature, said method comprising the steps of:

maintaining the temperature of a thermopile constant, except for temperature fluctuations due to the absorptivity or emissivity of the sample, at a value substantially above said ambient temperature;

exposing said sample to radiation exclusively from said thermopile; and

measuring the voltage across said thermopile, said measured voltage providing a measure of the absorptivity or emissivity of said sample.

4,204,121

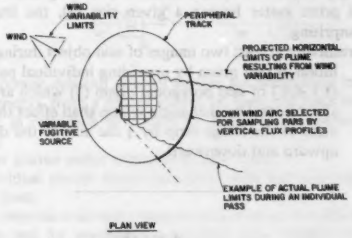
CYLINDRICAL METHOD OF QUANTIFYING FUGITIVE EMISSION RATES FROM POLLUTION SOURCES

George H. Milly, Potomac, Md., assignor to Geomet, Incorporated, Gaithersburg, Md.

Continuation-in-part of Ser. No. 895,427, Apr. 12, 1978, Pat. No. 4,135,092. This application Jan. 8, 1979, Ser. No. 1,997

Int. Cl.[2] G01J *1/00*; G01N *31/00*

U.S. Cl. 250—343 **18 Claims**


WIND VARIABILITY LIMITS
WIND
PERIPHERAL TRACK
PROJECTED HORIZONTAL LIMITS OF PLUME RESULTING FROM WIND VARIABILITY
DOWN WIND ARC SELECTED FOR SAMPLING PAIRS BY VERTICAL FLUX PROFILES
VARIABLE FUGITIVE SOURCE
EXAMPLE OF ACTUAL PLUME LIMITS DURING AN INDIVIDUAL PASS
PLAN VIEW

1. Cylindrical method of quantifying fugitive emission rates from pollution sources comprising:

A. driving a pollutant sensor in a peripheral arc surrounding a pollution source;

B. gauging wind velocity and direction at an index point downwind of the pollution source;

C. advancing said pollutant sensor to said index point;

D. outlining at said index point an arcuate pollution detection plane, said plane being oriented transversely and vertically with respect to the wind;

E. sensing pollutant concentration at a series of height intervals within the vertical and lateral confines of said arcuate pollution detection plane, so as to obtain integrated products of cross wind concentration and wind speed; and

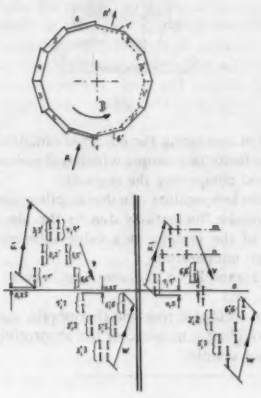
F. displaying said products as a vertical profile of total mass flux of pollutant through said detection plane.

4,204,122

METHOD OF AND DEVICE FOR SCANNING PICTURES

Josef F. Menke, Glücksburg, Fed. Rep. of Germany, assignor to Electro Optik GmbH & Co. KG, Glücksburg, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,597
Int. Cl.[2] G01J *1/00*; H01J *31/49*
U.S. Cl. 250—347 8 Claims



4. In an apparatus for generating a raster image of an object, in particular when using thermal or infra-red radiation, said apparatus having suitable optical means to guide images of individual strips of the object over a set of detectors consisting of a set of detectors having a given size defined by the width of the set plus the spacing between two individual detectors mounted normally to the direction of motion of the image strips, where said optical means is a rotating dihedral polygonal prism raster having a given size (3), the improvement comprising:

resolving at least two images of said object during one revolution of said prism by providing individual pairs of faces (1;1'-6;6') of said polygonal prism (3) which are additionally dihedral by that angle which shall effect the displacement of the image strip by ½ the size of the detector set upward and downward.

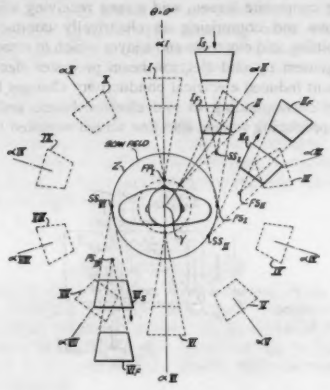
4,204,123

RADIONUCLIDE BODY FUNCTION IMAGER

Hugh F. Stoddart, Groton, Mass., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 20, 1978, Ser. No. 917,189
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S 7 Claims

1. A transverse radionuclide scan field imaging apparatus comprising a plurality of highly focused closely laterally adjacent collimators arranged inwardly focused in an array which surrounds a scan field, each collimator being moveable relative to its adjacent collimator; means for rotating said array about said scan field from one scan position to another scan position; means for imparting travel to said collimators such that for



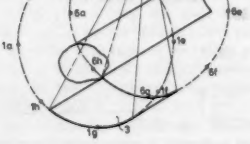
each such scan position the focal point of each said collimator uniformly samples at least one half of the scan field.

4,204,124

DEVICE FOR MEASURING RADIATION ABSORPTION IN A THREE-DIMENSIONAL OBJECT

Günter Kowalski, Rellingen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1978, Ser. No. 897,448
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1977, 2726635
Int. Cl.[2] A61B *6/00*
U.S. Cl. 250—445 T 3 Claims



1. A device for measuring radiation absorption in a section of a three dimensional object which lies between a first plane and a parallel second plane comprising:

radiation source means which project wedge-shaped beams of radiation from a plurality of positions in said first plane and from a plurality of positions in said second plane, through said object, to illuminate a detector area bounded by said first plane and second plane and

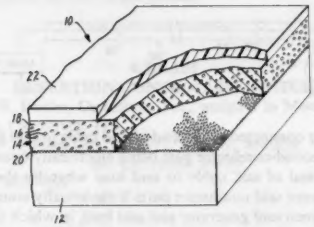
a two-dimensional radiation detector disposed on said detector area.

4,204,125

HIGH RESOLUTION X-RAY INTENSIFYING SCREEN WITH ANTIREFLECTING SUBSTRATE

Carol L. Fatuzzo, Pine Springs, Minn., and George D. Foos, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 27, 1978, Ser. No. 890,673
Int. Cl.[2] H01J 1/62
U.S. Cl. 250—486 13 Claims



1. A screen adapted for converting a first form of electromagnetic radiation into light comprising

a luminous sheet for emitting light of a given wavelength in response to excitation by radiation at another wavelength, such as upon x-ray bombardment, and having an antireflecting surface thereon characterized by a plurality of small, generally long and thin protuberances generally extending normal to said surface a distance not greater than about 1000 nm, the average amplitude of which is not less than 100 nm and having an average peak-to-peak spacing therebetween of not less than 20 nm to substantially prevent light emitted within the sheet which is directed toward the antireflecting surface from being either diffusely or specularly reflected, thus inhibiting reflected radiation from passing back through the sheet to impinge upon a light sensitive medium positioned adjacent the screen and minimizing the lateral spreading of emitted light, resulting in a significant increase in the resolution with which an image in said one form of electromagnetic radiation is imaged by the corresponding emitted light onto the photosensitive medium.

4,204,126

GUIDED FLOW WIND POWER MACHINE WITH TUBULAR FANS

Richard E. Diggs, P.O. Box 776, Carthage, Mo. 64836

Continuation of Ser. No. 852,054, Nov. 16, 1977, abandoned, which is a continuation of Ser. No. 624,385, Oct. 21, 1975, abandoned. This application Aug. 21, 1978, Ser. No. 935,504
Int. Cl.[2] F03D 9/02
U.S. Cl. 290—55 11 Claims

1. An apparatus for converting wind energy to electric power and for selectively storing excess electric power comprising:

a rotatable main frame assembly;

a plurality of power cells secured to said main frame assembly, each said power cell including a plurality of pairs of intermeshing fan wheels;

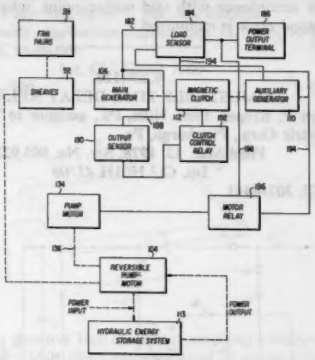
power train means connected to said pairs of fan wheels;

electrical generator means coupled to said power train means for generating electrical power;

a power storage system coupled to said electrical generator means for selectively storing excess power generated thereby;

wherein said power storage system comprises a plurality of massive weights, an hydraulic system for elevating said weights and reversible pump-motor means coupled to said hydraulic system and to said electrical generator means for raising said weights to store energy and for driving said electrical generator means to utilize stored energy; and

wherein said hydraulic systrm further comprises an hydraulic cylinder, connected to each of said weights, surrounding each of a plurality of pistons and hydraulic circuit means coupling said hydraulic cylinders with said reversible pump-motor including a buffer reservoir and a plurality of solenoid valve means for selectively coupling said buffer reservoir with each of said hydraulic cylinders.

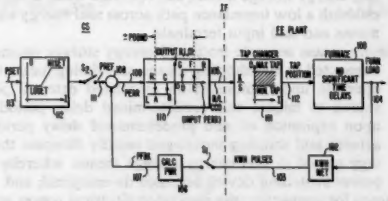


4,204,127

LOAD REGULATION AS PART OF AN ADAPTIVE PRIORITY DETERMINATION POWER DEMAND CONTROL SYSTEM

Woodward C. Carter, II, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,262
Int. Cl.[2] G05B 13/02, 11/32
U.S. Cl. 307—39 16 Claims



1. In a power demand control system for controlling loads drawing energy from a power source, at least one load being adjustable in reference to a level of power to be consumed including:

a power source meter common to said loads;

an individual power meter associated with said one adjustable load;

means responsive to said common power meter for selecting loads and for predicting a demand error relative to an assigned demand limit at the end of a control period, said demand error being predicted on a selection of available loads to be controlled for minimizing said demand error; and

means responsive to said predicted demand error for effectively controlling such selected available loads;

the combination of:

means responsive to said predicted demand error and operative as a result of said one adjustable load being selected for establishing a reference setting point defining said reference level of power to be consumed by said adjustable load;

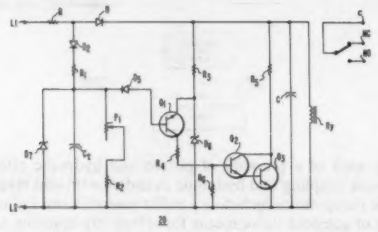
feedback means responsive to said individual power meter for providing a feedback error relative to said setting point and for establishing said reference level of power consumed by said adjustable load, thereby to change said reference level of power consumed by said adjustable load in accordance with said setting point, whereby said demand error is minimized.

4,204,128

ADJUSTABLE TIME DELAY RELAY

Andrew P. Kruper, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 13, 1978, Ser. No. 885,923
Int. Cl.[2] H01H *43/06*
U.S. Cl. 307—141 **15 Claims**



1. A time delay relay adapted for energization under normal conditions by an associated external power source, said relay comprising:

a power switching device comprising input terminals and output terminals;

energy storage means connected across said input terminals for maintaining energization of said power switching device during a predetermined delay period following failure of the associated power source;

shorting means connected across said input terminals and said energy storage means, and operable when actuated to establish a low impedance path across said energy storage means and said input terminals;

timing means separate from said energy storage means and connected to said shorting means, said timing means being operable upon failure of an associated external power source to initiate said predetermined delay period and upon expiration of said predetermined delay period to actuate said shorting means and rapidly dissipate the energy stored in said energy storage means, whereby said power switching device becomes de-energized; and

means for connecting the associated electrical power source to said timing means and to said energy storage means;

the values of said timing means components and the capacity of said energy storage means being selected such that said energy storage means can maintain energization of said input terminals throughout the duration of said predetermined time delay; whereby upon failure of the associated power source, said energy storage means will maintain energization of said input terminals until said timing means has operated said shorting means.

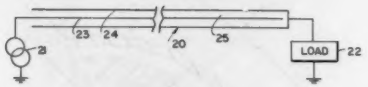
4,204,129

CAPACITANCE-COMPENSATED CABLE

Loren H. Hutchins, Jr., Portsmouth, N.H., assignor to Simplex Wire and Cable Company, Portsmouth, N.H.

Continuation-in-part of Ser. No. 668,267, Mar. 18, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,163
Int. Cl.[2] H01B *9/04, 7/30*
U.S. Cl. 307—147 **10 Claims**

1. In an electric-transmission system including a generator of a varying amplitude voltage, an electric load having an inductive power factor, and a transmission line having conductive links interconnecting said generator and said load, the improvement in which said conductive link includes a cable having a first-conductor part extending lengthwise of said cable, a second conductor part extending lengthwise of said cable, and solid dielectric material extending lengthwise of said cable and separating said first-and second-conductor parts in capacitive relationship distributed along the length of said cable, the amount of capacitance between said conductor parts being in excess of that required to match the inductive reactance of said conductive link, said first-conductor part being



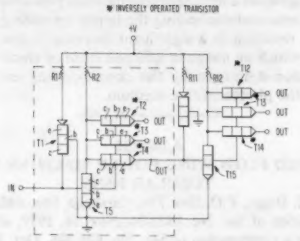
electrically connected at one end of said cable to said generator and said second-conductor part being electrically connected at the other end of said cable to said load whereby the capacitance between said conductor parts is electrically connected in series between said generator and said load, in which the cross-sectional area of said first-conductor part decreases along the length of said cable from a maximum at said one end of said cable to a minimum at said other end of said cable and in which the cross-sectional area of said second conductor part increases along the length of said cable from a minimum at said one end of said cable to a maximum at said other end of said cable.

4,204,130

MULTICOLLECTOR TRANSISTOR LOGIC CIRCUIT

James H. Harris, Danbury, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1978, Ser. No. 891,240
Int. Cl.[2] H01L *27/04;* H03K *19/08*
U.S. Cl. 307—215 **11 Claims**



7. An integrated transistor logic arrangement including at least first and second logic circuits, each of said first and second logic circuits comprising:

first and second power supply terminals;

a first transistor having first and second regions of first conductivity type separated by a third region of second conductivity type;

at least one second transistor having fourth and fifth regions of first conductivity type separated by a sixth region of second conductivity type;

the fourth region of said second transistor being electrically connected in common with the second region of said first transistor, the sixth region of said second transistor being electrically connected in common with the third region of said first transistor;

the first region of said first transistor being electrically connected to said first power supply terminal;

circuit means for supplying current from said second power supply terminal to the commonly connected third region

of said first transistor and the sixth region of said second transistor;

the commonly connected third region of said first transistor and sixth region of said second transistor being the input of the logic circuit, the fifth region of said second transistor being the output of the logic circuit;

the first and second power supply terminals of the first logic circuit being connected in common with the first and second power supply terminals of the second logic circuit, respectively; and,

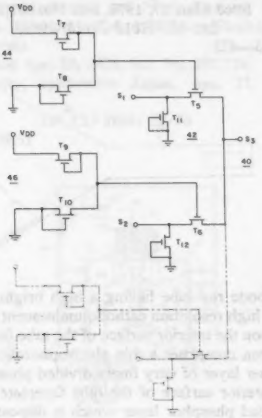
the input of the second logic circuit being connected to the output of the first logic circuit.

4,204,131

DEPLETION CONTROLLED SWITCH

Harold W. Dozier, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Oct. 11, 1977, Ser. No. 840,679
Int. Cl.² H03K *17/60*
U.S. Cl. 307—251 **3 Claims**



1. A bidirectional switch for use in an integrated circuit, comprising:

a first FET connected between a first option line capable of being at a high and low potential during operation of the integrated circuit and a designated line whereby the input function may originate on either the option line or the designated line,

a second FET connected between a second option line capable of being at a high and low potential during operation of the integrated circuit and a designated line whereby the input function may originate on either the option line or the designated line,

first means for selectively causing the FETs to be operable in either the depletion mode or the enhancement mode,

second means for applying a gate potential to the first FET to couple the first option line to the designated line in the event the first FET is operable in the depletion mode, or to isolate the first option line from the designated line in the event the first FET is operable in the enhancement mode, and

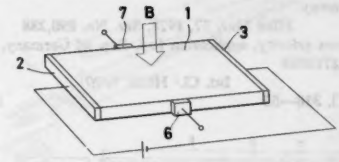
third means for applying a gate potential to the second FET to couple the second option line to the designated line in the event the second FET is operable in the depletion mode, or to isolate the second option line from the designated line in the event the second FET is operable in the enhancement mode.

4,204,132

HIGHLY SENSITIVE HALL ELEMENT

Shoei Kataoka, Tanashi; Yoshinobu Sugiyama, Musashi-Murayama, and Hiroyuki Fujisada, Kawasaki, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Aug. 8, 1977, Ser. No. 822,658
Claims priority, application Japan, Aug. 11, 1976, 51-94788; Aug. 11, 1976, 51-94789
Int. Cl.² H03B *7/00*
U.S. Cl. 307—309 **8 Claims**



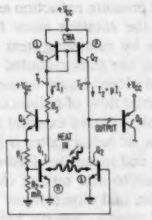
1. A highly sensitive Hall element comprising a semiconductor possessing a Hall effect and exhibiting an electron transfer effect in a high electric field, input current electrodes provided at the opposite ends of said semiconductor, at least one Hall output electrode provided at one side of said semiconductor, and means for applying to said input current electrodes a voltage large enough to lower the electron concentration available for the Hall effect in said semiconductor, the lowered electron concentration resulting in an increase in the Hall coefficient to thereby considerably enhance the sensitivity of the Hall element.

4,204,133

TEMPERATURE-SENSITIVE CONTROL CIRCUITS

Adel A. A. Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,078
Int. Cl.² H03K *1/00, 17/00*
U.S. Cl. 307—310 **7 Claims**



1. A temperature-sensitive control circuit comprising:

first and second transistors arranged to sense substantially the same temperature, each having base and emitter and collector electrodes;

a first source of current connected to the collector of said first transistor for supplying a first prescribed level of current of a polarity as may be conducted as collector current by said first transistor;

direct coupled collector-to-base feedback means provided said first transistor to apply an emitter-to-base potential thereto for conditioning said first transistor to conduct as collector current said first prescribed level of current from said first source of current;

means for scaling up the emitter-to-base potential of said first transistor in fixed proportion—i.e., for multiplying it by a constant greater than unity;

means for applying the scaled up, or multiplied, potential as the emitter-to-base potential of said second transistor; and an output terminal to which the collector electrode of said second transistor connects.

4,204,134

COOLANT LOOP FOR THE ROTOR OF A TURBOGENERATOR WITH A SUPERCONDUCTIVE EXCITER WINDING

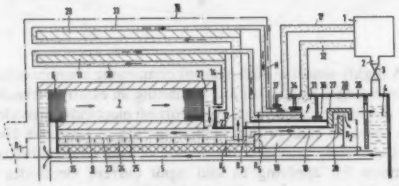
Werner Fritz, Bochum, and Erich Weghaupt, Mülheim an der Ruhr, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,288

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713885

Int. Cl.² H02K *9/00*

U.S. Cl. 310—52 **12 Claims**



1. In a coolant circulatory loop for a turbogenerator rotor having a superconductive field winding, cooling ducts and a damper and cold shielding surrounding the field winding, means external to the rotor for transferring deeply-cooled liquid helium thereto for cooling the field winding, damper and cold shielding, the damper and cold shielding being cooled by an at least partly vaporized partial flow of helium that has flowed through the field winding, a rotating mixing chamber mixing deeply-cooled liquid helium from the external transferring means with liquid helium which has flowed through the cooling ducts of the field winding, means for feeding liquid helium in forced circulation from said mixing chamber to the cooling ducts of the field winding wherein it is heated due to winding losses and pressure reduction and is partly evaporated, means located in the rotating rotor for recooling the non-evaporated helium by removing heat of vaporization therefrom and returning the thus recooled helium to said mixing chamber forming a closed liquid helium loop inside the rotor with a separate partial flow of helium cooling the damper and cold shielding, cooling means external to the rotor for recooling the partial flow of helium after it has cooled the damper and cold shielding and means for feeding the recooled partial flow of helium back to said mixing chamber, the amount of helium flowing from said closed liquid helium loop inside the rotor through said mixing chamber being a multiple of the at least partly vaporized partial flow of helium flowing through the damper and cold shielding to said external cooling means.

4,204,135

PIEZOELECTRIC ELEMENTS OF ORGANIC HIGH MOLECULAR WEIGHT MATERIALS

Naohiro Murayama, Iwaki, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

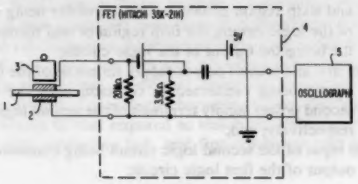
Continuation of Ser. No. 587,782, Jun. 17, 1975, abandoned, which is a continuation of Ser. No. 424,029, Dec. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 204,263, Dec. 2, 1971, abandoned. This application May 21, 1976, Ser. No. 688,818

Claims priority, application Japan, Dec. 2, 1970, 45/106022

Int. Cl.² H01L *41/18*

U.S. Cl. 310—357 **15 Claims**

1. A polymeric piezoelectric element comprising an unoriented shaped and polarized element of a copolymer of at least about 50% by weight of vinylidene fluoride and tetrafluoroethylene, said element having a piezoelectric modulus in excess of about 10^{-8} cgsesu.



4,204,136

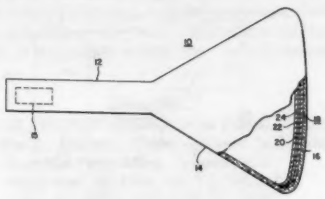
DUAL LAYER PHOSPHOR SCREEN FOR CATHODE RAY TUBE

Donald M. Phillips, Cayuta, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 17, 1978, Ser. No. 887,895

Int. Cl.² H01J *29/18, 29/30*

U.S. Cl. 313—473 **4 Claims**



1. A cathode ray tube having a high brightness with low noise level, high resolution cathodoluminescent display screen disposed upon the interior surface of the tube faceplate, which display screen comprises a thin electrophoretically deposited first phospher layer of very finely divided phosphor disposed upon the interior surface of the tube faceplate and a second gravity settled phosphor layer which is disposed on the first phosphor layer.

4,204,137

FLUORESCENT LAMP WITH REFRACTORY METAL ELECTRODE SUPPORTS AND GLASS FLARE SEAL STRUCTURE

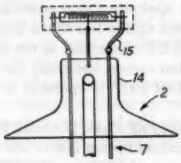
Ashutosh Roy, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Jul. 18, 1977, Ser. No. 816,564

Claims priority, application United Kingdom, Jul. 19, 1976, 30007/76; Oct. 8, 1976, 42004/76

Int. Cl.² H01J *61/30, 61/36, 61/42*

U.S. Cl. 313—491 **6 Claims**



1. In a fluorescent discharge lamp comprising a tubular light transmitting envelope having a fluorescent coating on the

interior wall thereof, coil electrodes at opposite ends therein, support wires connected to said coil electrodes passing through respective end walls of said envelope and sealed therethrough, and a fill comprising gas and mercury, an improved electrode support assembly comprising:

a glass flare adapted to be sealed in said envelope to form an end wall thereof, said flare being composed of soda-lime glass;

said support wires having

first portions sealed in said glass flare and comprising a metal alloy having a coefficient of thermal expansion matching that of said soda-lime glass; and

second portions which are disposed outside said glass flare and in operation of the lamp are exposed to electron bombardment, said second portions being welded to said first portions and comprising a refractory metal.

4,204,138

PERMANENT MAGNET-CONTAINING MAGNETRON

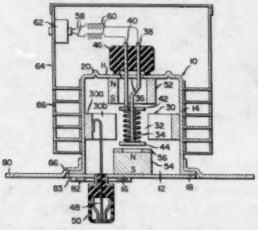
Tokuju Koinuma, Kawasaki, and Norio Tashiro, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 19, 1978, Ser. No. 897,726

Claims priority, application Japan, Apr. 27, 1977, 52-53700[U]

Int. Cl.² H01J *25/50*

U.S. Cl. 315—39.51 **3 Claims**



1. A magnetron comprising:

a highly evacuated cylindrical yoke cup member fabricated from a soft magnetic material, said cup member including a flange at its open end;

a resonant cavity unit having a plurality of anode vanes disposed coaxially within said yoke cup member, said anode vanes defining a central space within said yoke cup member;

a cathode positioned within said central space;

at least one permanent magnet within said cup member for driving said resonant cavity unit in cooperation with said cup member;

an end cap made of soft magnetic material for hermetically sealing the open end of said cup member;

an antenna;

means for coupling said antenna through said end cap to said resonant cavity; and

a fitting board having a bore therethrough, said bore having a diameter larger than that of said yoke cup member without said flange and smaller than the diameter of said cup member including said flange, said fitting board further including a flange rest about said bore, the closed end of said yoke cup member being inserted through said bore such that said flange of said yoke cup member engages said flange rest when said cup member is inserted through said bore.

4,204,139

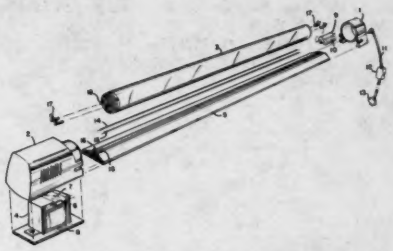
INTEGRAL FLUORESCENT LAMP-BALLAST UNIT

Robert M. Shimer, Topsfield; Joseph A. Dombrowski, Manchester, and Sheppard Cohen, Danvers, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 27, 1978, Ser. No. 890,278

Int. Cl.² H01J *25/50, 13/46, 19/78;* H01K *1/62*

U.S. Cl. 315—58 **6 Claims**



1. An integral fluorescent lamp-ballast unit comprising: a fluorescent lamp fastened to an end cap at one end and a housing at the other end; an elongated support member extending between the end cap and the housing, fastened to both, and serving as a backing for the lamp; and a ballast circuit disposed in the housing and/or the end cap, the ballast circuit including a choke, a preheat lamp starter and a circuit breaker, the circuit breaker being in close proximity to the choke ballast so as to be heated thereby, the circuit breaker being normally closed during normal lamp operation but becoming open and opening the circuit when the choke overheats.

4,204,140

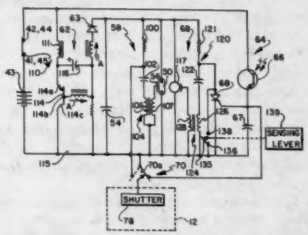
SAFETY CIRCUIT FOR ELECTRONIC FLASH APPARATUS

Roger L. Willis, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,451

Int. Cl.² H05B *41/32*

U.S. Cl. 315—241 P **9 Claims**



1. In electronic flash apparatus having a flashtube energizable for illuminating a scene, and a dischargeable firing capacitor coupled to said flashtube for producing a discharge current to energize said flashtube, the improvement comprising:

(a) an energizable quench circuit coupled to said firing capacitor for diverting said discharge current from said flashtube, thereby terminating energization of said flashtube;

(b) a safety circuit including a switch coupled to said quench circuit, said switch having (1) a normal, deactuated condition, and (2) an actuated condition in which said quench circuit is energized by said safety circuit; and

(c) a housing member movably associated with said switch and having (1) a first position in which said switch is

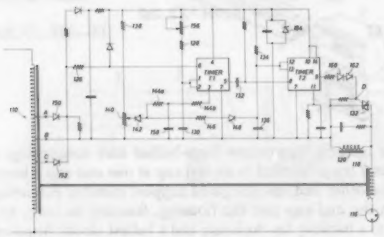
maintained in its deactuated condition, and (2) a second position in which said switch is moved to its actuated condition, thereby energizing said quench circuit for discharging said firing capacitor.

4,204,141

ADJUSTABLE DC PULSE CIRCUIT FOR VARIATION OVER A PREDETERMINED RANGE USING TWO TIMER NETWORKS

Eric L. H. Nuver, San Marcos, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,157
Int. Cl.[2] H04B *39/02*
U.S. Cl. 315—311 **18 Claims**



1. In a dimming circuit for a high intensity discharge lamp comprising

a reactive ballast including a first portion and a second portion, each in series with the lamp, said first portion connectable for at least partial current bypass to cause lamp dimming,

a gated semiconductor having its main terminals connected across said first reactive ballast portion,

the improvement in a gating circuit connectable to the gate of said gated semiconductor for providing a positionable unipolar dc pulse thereto within a time range of one-half of the line voltage applied to the lamp, said improvement comprising

a rectifier operably connectable to ac line voltage for producing rectified line voltage,

first timer means having a trigger input actionable when a voltage applied thereto is below a predetermined level for producing a dc pulse output, the duration of which is determined by the length of time that the voltage across a time constant network, discharged prior to application of the trigger input, builds to a predetermined control voltage level, said control voltage internally determining the level at which a threshold input actuates the timing conclusion event of said first timer means,

said first timer trigger input being operably connected to said rectified line voltage,

a first time constant network connected to the threshold input of said first timer means,

second timer means having a trigger input actionable when a voltage applied thereto is below a predetermined level for producing a dc pulse output, the duration of which is determined by the length of time that the voltage across a time constant network, discharged prior to application of the trigger input, builds to a predetermined control voltage level, said control voltage internally determining the level at which a threshold input actuates the timing conclusion event of said second timing means,

said second timer input operably connected to the dc pulse output of said first timer,

the output of said second timer being connected to the gate of the gated semiconductor,

a second time constant network being connected to the threshold input of said second timer means, and

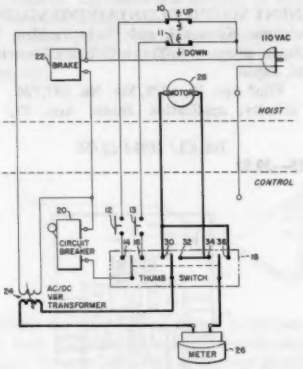
variable voltage means connected to change the control voltage level of said first timer means, a change of said first timer control voltage level causing a narrowing of first timer pulse output, and advancement of the dc pulse output of said second timer.

4,204,142

HOIST MOTOR CONTROL SYSTEM

David M. Scruggs, 27587 Brookside La., San Juan Capistrano, Calif. 92675

Filed Dec. 27, 1977, Ser. No. 864,371
Int. Cl.[2] H02K *11/00*
U.S. Cl. 318—257 **4 Claims**



1. An improved electric motor hand control of the type having a trigger for controlling current to a motor proportionally to trigger depression, the improvement comprising:

switching means for setting the rotational direction of said motor; and

interlock means for preventing movement of said switching means for setting said rotational direction when said trigger is depressed;

wherein said switching means comprises a three position switch manually movable to a first position for rotating said motor forward, a middle position for turning said motor off, and a third position for rotating said motor in reverse; and

wherein said interlock means comprises:

a first spring leaf having a fixed end and a free end;

a first actuator connected to said trigger and disposed adjacent to said first leaf for deflecting said first leaf when said trigger is depressed;

a first blocking pin attached to said first leaf free end and disposed adjacent to said three position switch for blocking movability of said switch to said first position when said first leaf is deflected;

a second spring leaf having a fixed end and a free end;

a second actuator connected to said trigger and disposed adjacent to said second leaf for deflecting said second leaf when said trigger is depressed; and

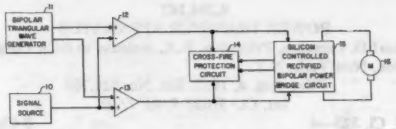
a second blocking pin attached to said second leaf free end and disposed adjacent to said three position switch for blocking movability of said switch to said third position when said second leaf is deflected.

4,204,143

PULSE WIDTH MODULATED POWER AMPLIFIER FOR DIRECT CURRENT MOTOR CONTROL

Randolph D. Coleman, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 26, 1978, Ser. No. 945,989
Int. Cl.[2] H02P 7/28
U.S. Cl. 318—341 **3 Claims**



1. A pulse width modulating power amplifier for direct current motor control comprising:

a signal source of input drive signals;

generating means for producing simultaneous positive and negative waveforms;

clockwise modulating means, having a first input connected to said signal source and a second input connected to said generating means, for producing clockwise drive pulses;

counterclockwise modulating means, having a first input connected to said signal source and a second input connected to said generating means, for producing counterclockwise drive pulses;

a silicon controlled rectifier power bridge having a first input connected to said clockwise modulating means, a second input connected to said counter-clockwise means, and having first and second outputs for providing a direct current of reversible polarity and wherein said silicon conrolled rectifier power bridge comprises:

a power supply;

a first switching transistor connected to said power supply;

a second switching transistor connected to said power supply;

a first silicon controlled rectifier connected to said first switching transistor;

a second silicon controlled rectifier connected to said second switching transistor and said first silicon controlled rectifier so as to form a bridge circuit;

a reversible direct current motor having first and second terminals, said first terminal connected to said first switching transistor and said second terminal connected to said switching transistor;

a first diode connected in parallel to said first silicon controlled rectifier;

a second diode connected in parallel to said second silicon controlled rectifier;

a third switching transistor, connected to said second silicon controlled rectifier, said first switching transistor and said counterclockwise modulating means, and

a fourth switching transistor connected to said first silicon controlled rectifier, said second switching transistor and said clockwise modulating means; and

a cross-fire protection means having a first input connected to said clockwise modulating means, a second input connected to said counterclockwise modulating means, a third input connected to said first output of said silicon controlled rectifier power bridge means and a fourth input connected to said second output of said silicon controlled rectifier power bridge means for preventing the driving of said silicon controlled rectifier power bridge means to a short circuit condition and wherein said cross fire protection means comprises:

a first NAND gate having first and second inputs, said first input connected to said counterclockwise modulating means and said second input connected to said first silicon controlled rectifier;

a second NAND gate having first and second inputs, said first input connected to said clockwise modulating means and said second input connected to said second silicon controlled rectifier;

a set reset flip-flop having not set and not reset inputs and having Q and not-Q outputs, said not set input connected to said second NAND gate and said not reset input connected to said first NAND gate;

a first shunting transistor operatively connected to said counterclockwise modulating means, and to said Q-output of said set-reset flip-flop; and

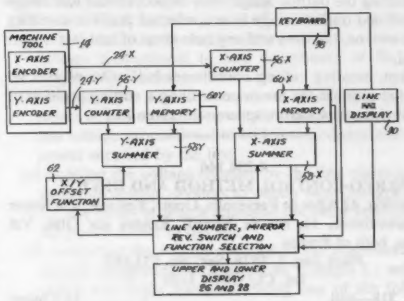
a second shunting transistor operatively connected to said first shunting transistor, said clockwise modulating means, and said not-Q output of said set reset flip-flop.

4,204,144

POSITION CONTROL SYSTEM

Richard D. Hill, Skokie, Ill., assignor to Midgitronics Inc., Oregon, Wis.

Filed Oct. 13, 1977, Ser. No. 841,729
Int. Cl.[2] G05B 19/42
U.S. Cl. 318—568 **10 Claims**



1. A method of positioning a movable element of a machine tool in a series of preselected positions comprising the steps of:

(a) establishing a reference coordinate;

(b) selecting a series of preselected positions;

(c) determining the X and Y coordinates relative to said reference coordinate of each of the positions in the series of preselected positions;

(d) entering and remembering each of said X and Y coordinates;

(e) determining the actual X and Y positions of the movable element with respect to said reference coordinate;

(f) selecting a first of said positions from the series of preselected positions;

(g) summing said X coordinate of the actual position of the movable element with the X coordinate of the selected first position to provide a difference therebetween;

(h) summing said Y coordinate of the actual position of the movable element with the Y coordinate of the selected first position to provide a difference therebetween;

(i) displaying the differences in a display;

(j) moving the movable element so that the differences are zero at the selected position;

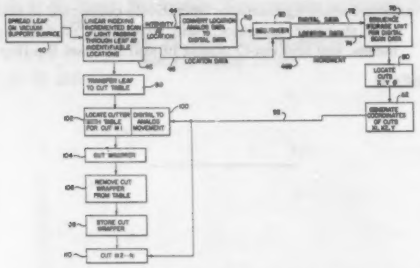
(k) selecting a second of said positions from said series; and

(l) repeating steps (g) through (j).

4,204,145
METHOD OF SELECTING THE CUTTING POSITION FOR A CIGAR WRAPPER ON A TOBACCO LEAF

Charles M. Hevenor, Jr., Bolton, and Kenneth O. Wood, Ellington, both of Conn., assignors to Gulf & Western Corporation, New York, N.Y.

Filed May 2, 1978, Ser. No. 902,245
Int. Cl.[2] G05B 19/42
U.S. Cl. 318—568 6 Claims



1. A method of selecting the cutting position of a cigar wrapper cutter having a given shape with respect to a natural tobacco leaf using a remotely created leaf image of a given tobacco leaf, which remotely created image includes the outline of the given leaf, the position of the leaf stem and the areas with holes in said leaf, said method comprising the steps of:

(a) providing an outline image of the given cutter shape;

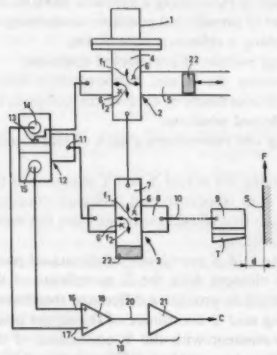
(b) shifting the outline image with respect to said leaf image until said outline image is in a selected position avoiding the outline, the stem and any hole areas of said leaf image; and,

(c) then, creating cutting coordinates indicative of said selected position for use in controlling a cutting position of said cigar wrapper cutter on said given leaf.

4,204,146
SERVO-CONTROL METHOD AND DEVICE

Jean Peiffert, 42 Allee de Persepolis, Orsay, Essonne, and Roger S. Barbedienne, 11, rue de Neuvill, Eragny sur Oise, Val d'Oise, both of France

Filed Jun. 1, 1978, Ser. No. 911,612
Int. Cl.[2] G05B 1/06
U.S. Cl. 318—640 11 Claims

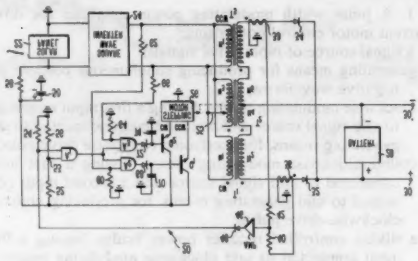


1. A method of servo-controlling the distance of an object from a transiting surface to be followed by said object and capable of reflecting microwaves, by exploiting a control signal, including the steps of disposing before the surface to be followed at least one radiating unit fast with the object and providing directive microwave radiation of a radient wave, simultaneously picking up the radiation reflected by said surface on said radiating unit, forming a reference phase by adjusting the phase of a portion of the radiated wave fed to a comparison means, comparing said reference phase with the reflected microwaves and using the signal resulting from such comparison to effect the required servo-control in relation to a predetermined distance that is a multiple of a quarter-microwave.

4,204,147
POWER TRANSFER APPARATUS

Robert D. Larrabee, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,786
Int. Cl.[2] H02J 7/00, 7/10
U.S. Cl. 323—4 3 Claims



1. The combination of:

a source of electrical power whose value may vary;

a load;

adjustable power transfer means for coupling the power from said source to said load;

sensing means coupled to said load for sensing a load parameter indicative of the power delivered by said power transfer means to said load and for producing a control signal in response thereto indicative of the level of said power;

said sensing means including means for providing first and second current paths between said power transfer means and said load, through which paths current may flow in a given direction to said load, and means for comparing the relative values of the currents in said first and second paths for producing said control signal manifesting said relative values; and

means responsive to said control signal for adjusting the power transfer means to alter the value of at least the current delivered by said power transfer means to said load in a sense to maximize said load parameter over a range of values of power produced by said source.

4,204,148
REGULATION CIRCUIT

Robert F. Gaertner, San Marcos, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,554
Int. Cl.[2] G05F 1/58, 1/64
U.S. Cl. 323—22 SC 5 Claims

1. A power supply regulation circuit for providing timing gate signals to a power section of a power supply, the occurrence times of the power section gate signals determining the dc output level of the power section, comprising:

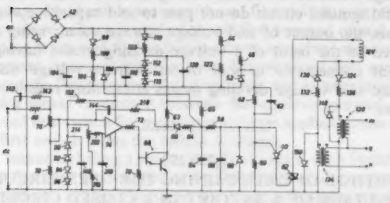
a first gated semiconductor device;

a second gated semiconductor device having its gate connected to said first device and connectable to a voltage source for supplying the power section gate signals at the time said second device is conductive;

a first network connected to one of the terminals of said first

device for supplying a control voltage to render said first device conductive by sensing the dc output level from the power section being regulated;

a second network connected to another of the terminals of said first device for rendering said first device conductive, said second network supplying a reference level derived from an applied ac source voltage;



said first device turning on when the relative levels of sensed dc output level and the applied reference level differ by a predetermined amount,

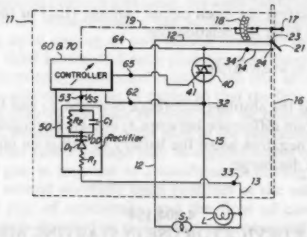
said first network including a disconnect network connected to said ac source voltage, and absence of ac source voltage causing said reference level supplied by said second network to become zero, said absence of ac source voltage causing a disconnection of said first network to thereafter prevent operation of said first gated device.

4,204,149

ELECTRONIC CONTROLLED-DURATION SWITCHING

James J. Cleary, 1828 S. Magnolia Ave., Yuma, Ariz. 85369, and John M. Cleary, 426 Washington Valley Rd., Martinsville, N.J. 08836

Filed Jul. 18, 1977, Ser. No. 816,739
Int. Cl.² H05B *39/02, 39/04*
U.S. Cl. 323—24 **10 Claims**



1. An electronic controlled system comprising

an electronic switch;

means for controlling said electronic switch for a prescribed time interval;

means for biasing the controlling means; and

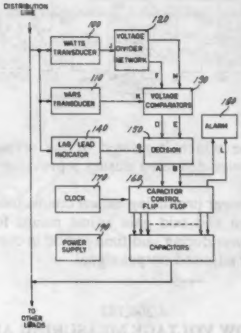
means for connecting said electronic switch in a first circuit with an energy source and a load and simultaneously connecting said controlling means in a second circuit with said energy source and said load for triggering said controlling means for each operation of the connecting means for said prescribed time interval.

4,204,150

APPARATUS AND METHOD FOR REGULATING THE POWER FACTOR IN AN ELECTRICAL DISTRIBUTING-NETWORK LINE

Serge Mathieu, Ste-Foy, Canada, assignor to H.O.P. Consulab Inc., Quebec, Canada

Filed Oct. 16, 1978, Ser. No. 951,955
Claims priority, application Canada, Jun. 20, 1978, 305891
Int. Cl.² H02J *3/18*
U.S. Cl. 323—102 **18 Claims**



1. A method for regulating the power factor in an electrical distributing-network line, comprising:

(a) measuring a first component of the line power by means of a transducer, the output from which is a continuous voltage proportional to said component of the power supplied by the line;

(b) measuring a second component of the line power by means of a transducer, the output from which is a continuous voltage proportional to said second component of the power supplied by the line;

(c) dividing the voltage supplied by the first component by means of voltage dividers to obtain two voltages L_1 and L_2, the values of which represent the limits prescribed for the power factor in the line;

(d) comparing the voltage supplied by the transducer of the second component with reference voltages L_1 and L_2 to obtain two logic levels indicating one of the following three operations:

(i) connecting one or more capacitors if the power factor is below said limit L_1;

(ii) disconnecting one or more capacitors if the power factor is above said limit L_2;

(iii) carrying out no operation if the power factor is above said limit L_1 and below said limit L_2.

4,204,151

STATIC VAR GENERATOR WITH NON-LINEAR FREQUENCY DEPENDENT DYNAMIC GAIN ADJUSTER

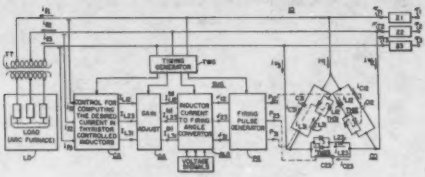
Laszlo Gyugyi, Penn Hills, and Michael B. Brennen, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 892,805
Int. Cl.² H02J *3/18*
U.S. Cl. 323—119 **11 Claims**

1. A VAR generator of the type which is connected to an electrical system for the purpose of supplying reactive power to the electrical system, comprising:

(a) calculating means for determining an estimated amount of reactive power that is to be provided to said electrical system during a given period of time, said calculating means providing an estimated reactive power output signal which is related to said estimated amount of reactive power;

(b) gain adjust means connected to receive said estimated reactive power output signal from said calculating means, the gain of said gain adjust means being variable to adjust the magnitude of said estimated reactive power output signal to provide a gain adjusted output signal, said variable gain being nonlinearly related to the difference between said estimated amount of reactive power and a



stored value which is related of the actual amount of reactive power delivered during a previous time period; and

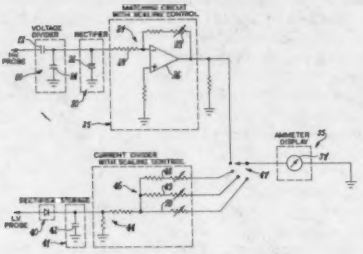
(c) reactive power producing means connected to said electrical system and said gain adjust means for providing reactive power during said time period in correspondence to said gain adjusted output signal.

4,204,152

HIGH AND LOW VOLTAGE MEASURING APPARATUS EMPLOYING A SINGLE DISPLAY AND IMPEDANCE MATCHING

James A. Imrie, 18 Amberley Crescent, Frankston, Victoria 3199, Australia

Filed Jul. 5, 1978, Ser. No. 922,195
Int. Cl.[2] G01R *19/00, 15/08, 15/04*
U.S. Cl. 324—390 **11 Claims**



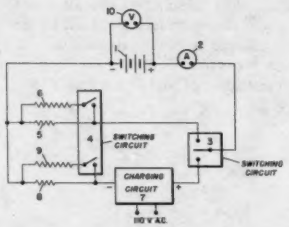
1. Diagnostic apparatus for measuring voltages in an ignition circuit of an internal combustion engine, said apparatus comprising, in combination: a high voltage measuring circuit and a low voltage measuring circuit, said high voltage measuring circuit comprising a capacitive voltage divider having a first capacitive means for connection to a point of measurement in said circuit to provide connection between said point and a second capacitive means of said divider, the voltage developed across said second capacitive means constituting the output of said voltage divider and being connected to a rectifying means comprising a first switching diode connected across said second capacitive means, the output of said rectifying means being connected to means for matching impedance at said rectifying means to a direct current voltage display means connectable to the output of said impedance matching means such that a displayed voltage is related to the high voltage in said ignition circuit, said impedance matching means comprising an operational amplifier having its inverting and non-inverting inputs connected to the output of said rectifying means, said first switching diode being connected across said second capacitive means such that unwanted portions of the high voltage in said ignition circuit do not pass to said operational amplifier, said low voltage measuring circuit comprising a voltage storage means, a further rectifying means for connection to a point of measurement in said circuit to provide connection between said point and said voltage storage means, said further rectifying means comprising a second switching diode and said voltage storage means comprising a capacitive storage means, said second switching diode being connected to said capacitive storage means such that unwanted portions of the low voltage in said ignition circuit do not pass to said capacitive storage means, the output of said voltage storage means being connected to the input of a voltage dividing means having its output connectable to said direct current voltage display means, said voltage dividing means comprising resistive elements.

4,204,153

METHOD OF DETERMINING THE OPEN CIRCUIT VOLTAGE OF A BATTERY IN A CLOSED CIRCUIT

William E. Brown, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 1, 1978, Ser. No. 939,157
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—429 **3 Claims**



1. A method of determining the open circuit voltage of a battery or cell operating in a closed circuit, without interrupting said circuit or substantially destabilizing said battery or cell, said method comprising:

(1) measuring the battery or cell current (I_1) and voltage (E_1) under a given load,

(2) altering said load by a fractional amount and remeasuring the battery or cell current (I_2) and voltage (E_2) under the altered load, and

(3) calculating the open circuit voltage (E_{oc}) of the battery or cell from the relationship

$$E_{oc}=E_1+(\Delta E/\Delta I)I_1,$$

where ΔE is the absolute difference between E_1 and E_2 and ΔI is the absolute difference between I_1 and I_2, the algebraic sign of I_1 being negative when the battery or cell is on charge and positive on discharge.

4,204,154

PORTABLE DEVICE FOR USE IN STARTING AIR-START UNITS FOR AIRCRAFT AND HAVING CABLE LEAD TESTING CAPABILITY

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; William R. Rosier, Tracy, and George G. Volk, Lancaster, both of Calif.

Filed Mar. 9, 1978, Ser. No. 885,066
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **1 Claim**

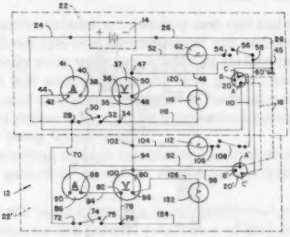
1. In a portable device particularly suited for use in initiating operation of air-start units for aircraft, an improved circuit comprising:

A. a D. C. voltage source including a positive and a negative terminal;

B. a pair of terminal plugs, each plug of said pair being characterized by a first, second and third terminal, the second terminal of each plug being connected in series with the negative terminal of the voltage source;

C. a pair of subcircuits, each subcircuit of said pair of subcircuits comprising a first normally open switch connected to the positive terminal of said voltage source, means including a lead for connecting the first terminal of one plug of said pair in series with said first switch, whereby a positive voltage is applied to said first terminal of said one plug when said first switch is closed, amperage measuring means interconnected in series between said first switch and the first terminal of said one plug, and voltage measuring means connected between the negative terminal and said first switch for measuring voltages applied across said first switch when the switch is closed;

D. means including a pair of electrical cables, each including a first lead for connecting the first terminal of one plug to one side of an air-start unit and a second lead for connecting the second terminal of said one plug to the other side of the air-start unit, whereby a voltage is applied across said air-start unit in response to a closing of said first normally open switch; and



E. means for examining the electrical continuity of the leads of each cable of said pair of cables including within said first and second subcircuit test circuit means for connecting the third terminal of each plug to the negative terminal of said voltage source, each of said test circuit means including a second normally open switch interposed in series between the negative terminal of the voltage source and the third terminal of one plug of said pair and a lamp connected in series between the second normally open switch and the negative terminal, whereby a circuit is completed through said lamp, between the negative terminal of the voltage source and the third terminal of the one plug upon closing of said second normally open switch, said third terminal of each plug being adapted to receive in electrically connected relation one end of one lead of one cable of said pair of cables so that the first terminal of each plug of said pair of plugs may be connected to the third terminal of the other plug of the pair simultaneously, in order that a voltage may be applied across each lead of said pair in response to a simultaneous closing of the first and second normally open switches of the subcircuits of said pair of subcircuits, and the flow of current therethrough detected at said lamps and measured at the amperage measuring means of said subcircuits.

4,204,155

AUTOMATIC FOUR-POINT PROBE

Malvin D. Terry, Phoenix, Ariz., assignor to Advanced Semiconductor Materials/America, Phoenix, Ariz.

Filed Jul. 28, 1978, Ser. No. 928,994
Int. Cl.[2] G01R *31/02, 27/14*
U.S. Cl. 324—158 F **1 Claim**

1. In an automatic mechanism for locating an electrical measurement probe and placing it in contact with a flat substrate on which electrical measurements are to be made, said mechanism including

a base,

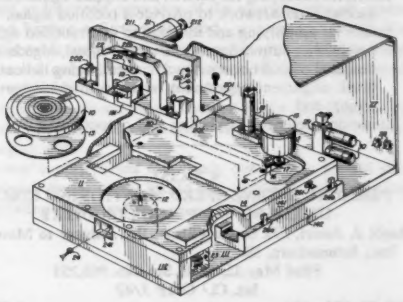
a rotatable support for said substrate carried by said base,

a carriage for said probe carried by said base,

electrical stepper motor means for moving said carriage relative to said substrate support and for rotating said substrate support,

cam means carried on said probe carriage for moving said probe vertically relative to said substrate support, and

means for automatically controlling said stepper motor means and said cam means to automatically position said probe on said substrate at preselected locations,



the improvements whereby torsional and lateral forces between said probe and said substrate and electrical interference with said measurements are inhibited, comprising:

(a) means for de-energizing said stepping motor means when said probe is positioned at each of said preselected locations;

(b) brake means for preventing rotation of said substrate support and movement of said carriage when said stepper motor means are de-energized; and

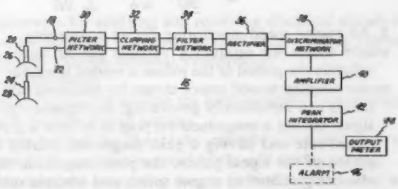
(c) means for mounting said cam means on said carriage such that vertical force exerted on said probe is applied perpendicularly to said substrate.

4,204,156

APPARATUS FOR ALIGNING BRUSHES OF A DYNAMOELECTRIC MACHINE

Fred H. Sawada, Scotia, and Melvin Howenstein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,214
Int. Cl.[2] G01R *31/02;* G08B *21/00*
U.S. Cl. 324—158 MG **8 Claims**



1. Apparatus for aligning brushes of a dynamoelectric machine to minimize arcing of the brushes, said apparatus comprising:

means for receiving from a brush of the dynamoelectric machine a composite signal including noise signals and high-frequency information signals, said composite signal produced during an operating mode of the dynamoelec-

tric machine wherein a buck or boost current is superimposed on a preselected level of excitation current applied to the machine;

a first filter network for removing low-frequency components of said noise signals from said composite signal;

a clipping network connected to said first filter network for removing from said composite signal all components having an absolute value of amplitude in excess of a preselected value.

a second filter network for removing from said composite signal substantially all of the components of said noise signals input to said second network filter and having frequencies less than a cutoff value determined from the fundamental slot and bar frequencies of the dynamoelectric machine;

means for rectifying the filtered and clipped signal from said second filter network to provide a rectified signal;

means for amplifying and integrating said rectified signal to produce an output signal, said output signal, together with the level of said boost or buck current, being indicative of brush alignment adjustment required to minimize brush arcing; and

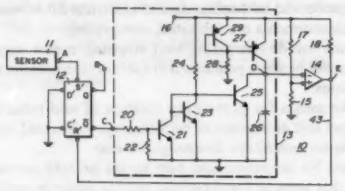
an output meter for displaying said output signal.

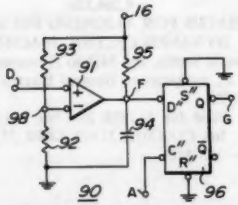
4,204,157

PERIODIC ENGINE SPEED MONITORING CIRCIT UTILIZING SAMPLING CIRCUITRY

Rupin J. Javeri, Elk Grove Village, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 12, 1978, Ser. No. 905,253
Int. Cl.² G01P 3/42
U.S. Cl. 324—166 **3 Claims**





1. An engine speed monitoring circuit comprising:

sensor means for producing variable period signal pulses wherein the period of the pulses is related to engine speed;

means coupled to said sensor means for receiving said signal pulses and periodically generating, in response thereto, a signal having a magnitude varying at at least a predetermined rate and having a peak magnitude related to the period of the signal pulses, the peak magnitude thereby also being related to engine speed, and wherein said peak magnitude occurs at the occurrence of said input signal pulses; and

sampling means coupled to said sensor means and said varying magnitude signal generating means for producing an output signal having a magnitude related to the peak magnitude of said varying magnitude signal by utilizing said signal pulses to insure that the magnitude of said varying signal, only substantially at the occurrence of said signal pulses, determines said output signal, said output signal magnitude being maintained after the occurrence of each of said signal pulses until the next updating of the output signal magnitude at the next occurrence of said signal pulses,

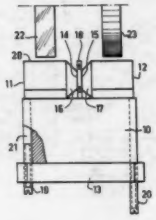
said sampling means including a controllable gate means connected in series between said varying magnitude signal generating means and said output signal, said gate means having a control terminal receiving said signal pulses which result in effectively closing said gate means only during the occurrence of said signal pulses to provide a series signal path between said varying magnitude signal generating means and said output signal only at the occurrence of said signal pulses.

4,204,158

HALL EFFECT POSITION DETECTOR USING A SINGLE PERMANENT MAGNET

Jean-Pierre Ricouard, Suresnes, and Bruno Schorter, Morsang, Orge, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,714
Claims priority, application France, Apr. 20, 1977, 77 11875
Int. Cl.² G01R 33/12
U.S. Cl. 324—208 **10 Claims**



1. A Hall-effect position detector comprising a Hall-effect crystal, a stationary magnetic exciter circuit for the Hall-effect crystal which exciter circuit has an axis of symmetry, the exciter circuit being arranged to cooperate with a movable part movable in the immediate proximity of said detector and which comprises soft-magnetic elements which during their movement are respectively and alternately situated on either side of the axis of symmetry with a trailing end of one soft-magnetic element situated on one side of said axis substantially coinciding with a leading end of a soft-magnetic element situated on the other wise of the said axis of symmetry, the magnetic exciter circuit comprising a single permanent magnet having one pole face oriented towards the movable part and provided with two symmetrical soft-magnetic pole pieces on said pole face arranged to cooperate with said movable part and between which a narrow gap is formed in which the Hall-effect crystal is disposed on said axis of symmetry.

4,204,159

EDDY-CURRENT TEST PROBE WITH SEGMENTED CIRCUMFERENTIAL TEST GAP AND METHOD FOR INSPECTION OF MATERIALS

Suren Sarian, 145 N. El Camino Real #211, San Mateo, Calif. 94401, and Duane P. Johnson, 702 El Granada Blvd., El Granada, Calif. 94018

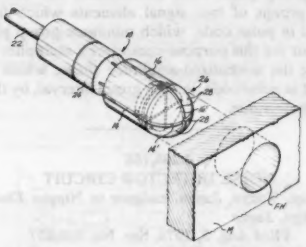
Filed Apr. 18, 1978, Ser. No. 897,344
Int. Cl.² G01R 33/12
U.S. Cl. 324—232 **26 Claims**

1. An eddy-current inspection tool, comprising:

a plurality of eddy-current generators angularly grouped about an axis;

each said eddy-current generator comprising:

an inner body of low reluctance material, including:
an elongated core part which is parallel to and spaced radially outwardly from said axis,
a first magnetic field guide extending generally radially at one end of said core part, and
a second magnetic field guide extending generally radially at the second end of said core part, said magnetic field guides being apart axially at a common radial boundary of said eddy-current generator, to form an axial gap;
an exciting coil of insulated electrically conductive wire surrounding said core part;



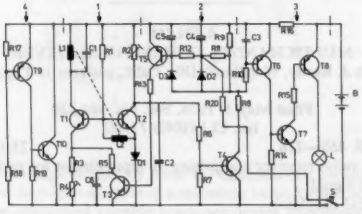
high reluctance material surrounding said coil and extending radially from said coil into said axial gap and terminating substantially even with gap bordering surface portions of said first and second magnetic field guides, said surface portions and said axial gap together forming a circumferential test region which in use is positioned contiguous the material being tested; and
external sheathing of high reluctance material on said eddy-current generator except at the circumferential test region,
said high reluctance materials being positioned to substantially eliminate the parallel reluctance of said coil.

4,204,160

METAL DETECTOR CIRCUIT WITH AUTOMATIC OPTIMUM SENSITIVITY ADJUSTMENT

Walter Voll, Industriestrasse 40,, 8728 Hassfurt, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,809
Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722511
Int. Cl.[2] G01V *3/08*
U.S. Cl. 324—236 **6 Claims**



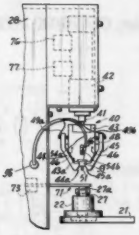
1. A metal detector comprising:
(a) oscillator circuit means comprising
(i) a first transistor;
(ii) a second transistor;
(iii) adjustable resistor means coupled to the emitter of the first transistor; and
(iv) inductor means coupled to the base of the second transistor to control the conductive state thereof;
the oscillator circuit means being arranged to generate an electromagnetic field and the second transistor being arranged to provide an output signal in response to and corresponding to any disturbance of the electromagnetic field caused by the presence of a metal article in the electromagnetic field;
(b) indicating circuit means arranged to receive the output signal and to indicate the presence of the metal article in response to the output signal;
(c) regulating circuit means arranged to receive the output signal and to control the resistance value of the adjustable resistor means, the regulating circuit means comprising:
(i) charging circuit means comprising at least one capacitor, and discharging means coupled to the at least one capacitor; and
(ii) a regulating transistor having a base electrode coupled to said at least one capacitor of the charging circuit means and having a further electrode so connected with the adjustable resistor means as to reduce the resistance value thereof only during the presence of the output signal provided by the second transistor;
(d) precharging circuit means coupled to the charging circuit means to enable the charging circuit means to be precharged; and
(e) power supply means selectively connectible to said precharging circuit means and to said oscillator, indicating and regulating circuit means.

4,204,161

APPARATUS FOR RAPIDLY TESTING ELECTROCHEMICAL CELLS

John J. Strickland, Alachua, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Mar. 1, 1978, Ser. No. 882,354
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—426 **14 Claims**

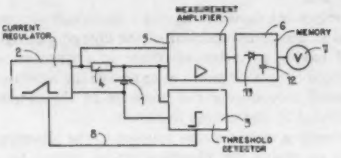


1. Apparatus for applying and receiving electrical signals at the external terminals of electrochemical cells having a central terminal and a casing terminal, comprising:
a probe assembly;
actuating means for moving the probe assembly into contact with the cell during testing;
a probe carried by the probe assembly and disposed to contact the central terminal of the cell during testing;
casing terminal contacting means carried by the probe assembly so as to be resiliently and yieldably biased into contact with the cell casing when said probe is moved into contact with the central terminal of the cell, said casing terminal contacting means being electrically isolated from said probe; and
signal conductors electrically connected to said probe and casing terminal contacting means for applying and receiving electrical signals.

4,204,162
METHOD OF CONTROLLING THE CONDITION OF AN ELECTRIC BATTERY AND APPARATUS FOR CARRYING OUT THIS METHOD

Jacques H. Froidevaux, La Chaux-de-Fonds, Switzerland, assignor to Electronic Time Company ETIC S.A., La Chaux-de-Fonds, Switzerland

Filed Jan. 16, 1978, Ser. No. 869,582
Claims priority, application Switzerland, Jan. 21, 1977, 717/77
Int. Cl.² G01N *27/42*
U.S. Cl. 324—430 **7 Claims**

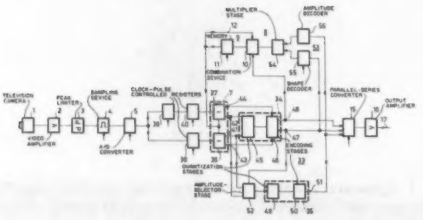


1. A method of determining the freshness of an electric battery, said method comprising:
- discharging the battery with a load current having an amplitude increasing linearly as a function of time,
- measuring the value of the voltage of said battery as said battery is discharged, and
- measuring the amplitude of said load current when said value of said battery voltage decreases to a predetermined value, said measured load current amplitude being representative of said battery freshness.

4,204,163
MINIMUM GROUP PULSE CODE MODEM HAVING SHAPE AND AMPLITUDE CODES

Frank de Jager, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1978, Ser. No. 917,494
Claims priority, application Netherlands, Jul. 6, 1977, 7707475
Int. Cl.² H03K *13/22*
U.S. Cl. 375—25 **1 Claim**

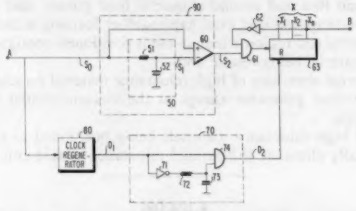


1. A transmission system for the transmission of signal elements of an information signal, which elements are spaced at fixed clock intervals, by means of a pulse code comprising a plurality of pulses, said system comprising a transmitter and a receiver, the transmitter being provided with a pulse code modulation device, which, before the transmission to the receiver, converts the signal elements applied to the input of said device into said pulse code, while the receiver is provided with a pulse code demodulation device which reproduces the transmitted information signal from said pulse code; wherein on the transmission side, the pulse code modulation device takes the form of a minimum-group pulse code modulator, for the pulse code conversion of adjoining minimum groups of two signal elements of the information signal, comprising a shape encoder, which in each group interval encodes a common shape of normalized amplitude of the signal variation of the two signal elements at the input of the minimum group pulse code modulator by a pulse code, and furthermore comprising an amplitude encoder which in each group interval, encodes an associated amplitude value by a pulse code, the pulse codes generated by the shape encoder and by the amplitude encoder in each group interval being jointly transmitted as a composite pulse code, while in the receiver, for the reproduction of the transmitted information signal, the composite pulse code being applied to a pulse code demodulation device, in the form of a minimum-group pulse code demodulator for the adjoining minimum groups of two signal elements which have been transmitted in pulse code, which minimum-group pulse code demodulator for this purpose comprises a multiplier stage for multiplying the normalized-amplitude shape, which has been transmitted in pulse code, in each group interval, by the associated amplitude value.

4,204,164
NOISE DETECTOR CIRCUIT

Kouzou Kage, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1978, Ser. No. 930,837
Claims priority, application Japan, Aug. 8, 1977, 52-94144
Int. Cl.² H04B *1/10*
U.S. Cl. 455—135 **8 Claims**



1. A noise detector circuit for a radio receiver, comprising:
- a delay circuit for slightly delaying a received signal containing noise,
- a comparator for comparing the level of said received signal with the output level of said delay circuit to generate a pulse sequence having a number of pulses per unit time that is proportional to the level of said noise, and
- a counter for counting the number of the output pulses of said comparator to detect the level of said noise.

4,204,165
MULTICHANNEL COHERENT RECEIVER

Patrick J. Ready, Woodland Hills, Calif., assignor to Typoligics, Inc.

Filed May 1, 1978, Ser. No. 901,328
Int. Cl.² H04B *17/00*
U.S. Cl. 455—226 **21 Claims**

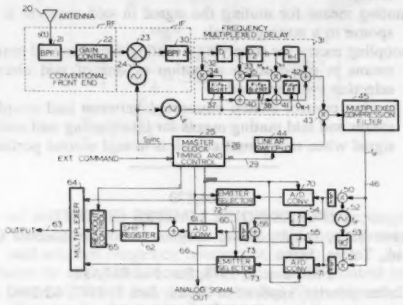
1. A radio receiver comprising an input circuit for receiving a radio signal;
- a local oscillator;
- means for mixing a radio signal at said input circuit with at least one local oscillator frequency to produce a convenient intermediate frequency product of said radio signal and said local oscillator frequency;
- a variable frequency oscillator generator having a predetermined scan rate;
- a delay line including a plurality of taps;
- means for introducing the intermediate frequency product of said mixing means into said tapped delay line;
- a respective oscillator for each of said taps, each of said oscillators having a frequency which is a function of

(k−n)RT where K−1 is the number of taps, R is the scan rate of the variable frequency oscillator generator, T is a constant and n is the number of a particular tap;

means for mixing the output of each of said taps with the output of its respective oscillator to provide a plurality of outputs;

means for combining the plurality of outputs to produce frequency multiplexed delayed products;

means for mixing the output of said variable frequency oscillation generator with the output of said combining means;



a filter having a variable delay-frequency characteristic matched to the time variation rate of said variable frequency oscillation generator coupled to the output of said last mixing means and having a maximum delay value T; and

means connected to the output of said filter for utilizing the signal whereon;

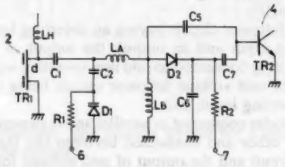
whereby said receiver develops a Fourier transformation of input signals with amplitude and phase information preserved.

4,204,166

VERY HIGH FREQUENCY TUNER

Itiro Araki, Shijonawate, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 15, 1979, Ser. No. 20,846
Claims priority, application Japan, Mar. 15, 1978, 53-30697
Int. Cl.[2] H04B *1/18*
U.S. Cl. 455—289 **4 Claims**



1. A very high frequency tuner for selection of a broadcasting signal through variation of a reactance value formed across a voltage controlled variable reactance device responsive to a tuning control signal, comprising

high frequency amplifier means,

tuned coupling means coupled to said high frequency amplifier means for selectively withdrawing a tuned high frequency signal,

local oscillator means for providing an oscillation frequency signal the frequency of which is different by a given frequency difference from said selectively withdrawn tuned high frequency signal,

mixer means responsive to said tuned high frequency signal from said tuned coupling means and said local oscillation frequency from said local oscillator means for providing an intermediate frequency signal,

said tuned coupling means comprising

a first inductance coil coupled in series between said high frequency amplifier means and said mixer means,

a voltage controlled variable reactance device coupled to the input of said first inductance coil in a shunt fashion so as to be responsive to a tuning control voltage, whereby a reactance value formed thereacross is variable as a function of the tuning control voltage,

a second inductance coil coupled to the output of said first inductance coil in a shunt fashion,

a first capacitor coupled to the output of said first inductance coil in a shunt fashion,

switching means responsive to a band selection switching control signal for achieving a parallel tuning circuit including said voltage controlled variable reactance device and said first and second inductance coils in the low frequency band mode and for achieving a π-type tuning circuit including said voltage controlled variable reactance device, said first inductance coil and said first capacitor in the high frequency band mode, and

coupling means for coupling the output of said tuned coupling means to said mixer means, said very high frequency tuner further comprising

means for providing a tuning control voltage to said voltage controlled variable reactance device, and

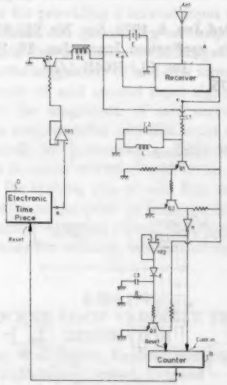
means for providing a band selection switching control signal representing selection of high or low frequency band.

4,204,167

ELECTRONIC TIME PIECE AUTOMATIC CALIBRATING DEVICE

Yung-Ho Liu, 4th Fl., No. 6, La. 1, 10th St., Houkong, Shihlin, Taipei, Taiwan

Filed May 24, 1978, Ser. No. 909,281
Int. Cl.[2] H04B *1/16*; G04C *11/02*
U.S. Cl. 455—231 **5 Claims**

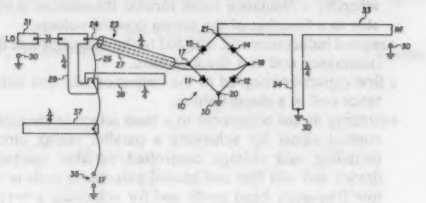


1. An electronic timepiece calibrating device comprising, in combination, a receiver for receiving a time signal from a broadcasting station, an electronic timepiece having resetting means for returning said timepiece to a zero setting, means controlled by said electronic timepiece for energizing said receiver, means connected to said receiver for converting the time signal from said receiver to a series of impulses, means for counting said series of impulses and for generating an output pulse when said series of impulses correspond in number to the frequency of said time signal and means for feeding said output pulse to said electronic timepiece to actuate said resetting means.

4,204,168
SIGNAL CONVERTER USING A QUAD DIODE RACE

Kenneth L. Brown, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 7, 1977, Ser. No. 840,210
Int. Cl.² H03C *1/58*
U.S. Cl. 455—330 **9 Claims**

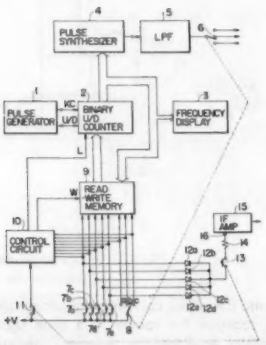


1. A mixer for mixing a radio frequency signal in the 500 to 5000 MHz region with a local oscillator signal to obtain an intermediate frequency signal, comprising:
- a substrate,
- a quad-diode race, carried on said substrate and having first and second pairs of input connection ports,
- said first pair of connection ports having one port connected to ground and another port connected to receive the radio frequency signal, and
- a balun connected to deliver the local oscillator frequency to said second pair of input connection ports
- said connections to said first and second pairs of input connection ports being made on a single side of said substrate.

4,204,169
MUTING CIRCUIT IN AN ELECTRONIC TUNING TYPE RECEIVER

Reisuke Sato, and Tomohisa Yokogawa, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 8, 1978, Ser. No. 913,925
Claims priority, application Japan, Jun. 10, 1977, 52/68496
Int. Cl.² H04B *1/10*
U.S. Cl. 455—175 **5 Claims**

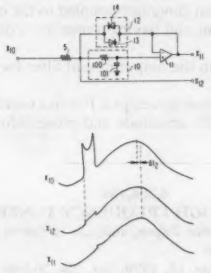


1. An electronic tuning type receiver of the type in which the output from a manually controlled up-down counter is used to control the tuning section of the receiver, and in which the contents of a read-write memory addressed by the actuation of band selection and channel selection switches may be loaded into said counter to thereby cause said tuning section to select a desired band and channel, said receiver further comprising:
- a preset switch movable between a first position and a second position in which it provides at its output a preset signal;
- a control circuit for detecting the actuation of at least one of said band selection and channel selection switches and providing a load signal in response to which the addressed contents of said memory are loaded into said counter and a write-signal in response to which the contents of the counter are loaded into the addressed memory, said control circuit providing said load and write signals when said preset switch is in said first and second positions, respectively;
- muting means for muting the signal in said receiver in response to a muting signal;
- coupling means for supplying a muting signal to said muting means in response to actuation of one of said channel selection switches; and
- a muting control switch connected between said coupling means and said muting means for interrupting said muting signal when said preset switch is in said second position.

4,204,170
IMPULSE NOISE LIMITER CIRCUIT

Kouzou Kage, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1978, Ser. No. 867,410
Claims priority, application Japan, Jan. 7, 1977, 52-1042
Int. Cl.² H03K *1/10, 5/08*
U.S. Cl. 328—165 **2 Claims**



1. An impulse noise limiter circuit for removing impulse noise contained in a signal, comprising:
- a delay circuit having an input and an output for delaying said signal;
- a voltage follower circuit having an inverting input, a non-inverting input and an output, the output of said delay circuit being connected to said non-inverting input and the output of said voltage follower circuit being coupled to said inverting input; and
- a pair of diodes connected in parallel and in opposite polarity to each other and connected between the input of said delay circuit and the output of said voltage follower circuit, whereby said voltage follower circuit provides isolation between the output of the delay circuit and said pair of diodes.

4,204,171
FILTER WHICH TRACKS CHANGING FREQUENCY OF INPUT SIGNAL

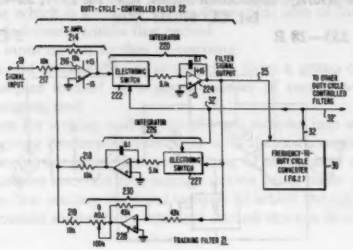
Eldon M. Sutphin, Jr., Merrimack, N.H., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,889
Int. Cl.² H03B *3/04*
U.S. Cl. 328—167 **6 Claims**

1. A tracking filter, comprising
- a duty-cycle-controlled variable-frequency band-pass filter having a signal input terminal receptive to an electrical

signal having many frequency components and having a signal output terminal for a selected frequency component which varies in frequency in direct proportion with engine speed, and having a frequency control input terminal,

a frequency-to-duty-cycle converter coupled to said output terminal and operative repeatedly to translate each period



of said selected frequency component to a rectangular wave having a duty cycle proportional to the frequency of said selected frequency component, and

means to apply said rectangular wave to the control input terminal of said duty-cycle-controlled filter, whereby the filter tracks changes in the frequency of the selected frequency component passed by the filter.

4,204,172
AUTOMATIC GAIN CONTROL DEVICE FOR A SINGLE-SIDEBAND RECEIVER

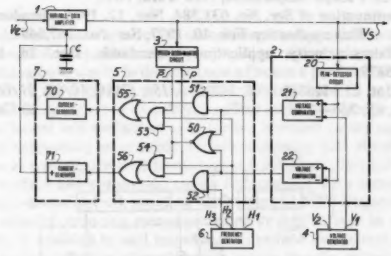
Jean-Claude Ben Sadou, and Pierre Deman, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 20, 1978, Ser. No. 952,954

Claims priority, application France, Oct. 25, 1977, 77 32051

Int. Cl.[2] H03G *3/20*

U.S. Cl. 330—134 **5 Claims**



1. An automatic gain control device for a single-sideband receiver, comprising:

at least one variable-gain amplifier having an output for producing an output signal, a discriminator circuit for delivering one of a first or a second signal according to whether or not speech is present in a signal received by said receiver,

detecting means coupled to said amplifier for producing one of a third or a fourth signal according to whether the level of said output signal is above a value V_a, V_a being a predetermined value corresponding to a predetermined correct listening level of said receiver, or below a value V_b, V_b being a predetermined value corresponding to a hearing threshold level of said receiver, and

a control circuit, coupled to said discriminator circuit and to said detection means, said control circuit comprising controlling means for bringing the output level of said variable-gain amplifier to said value V_a with a first time constant value when said third signal is present, to said value V_a with a second time constant value when said third and fourth signals are absent and said first signal is present simultaneously, to said value V_b with a third time constant value when said third and fourth signals are absent and said second signal is present simultaneously, and to said value V_b with a fourth time constant value whenever said fourth signal is present.

4,204,173
TUNING CIRCUIT WITH PROVISIONS FOR REDUCING PULSE WIDTH JITTER

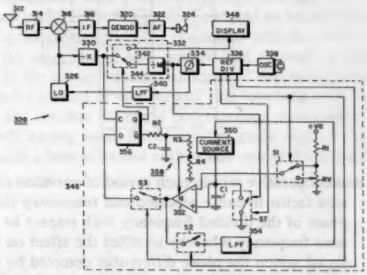
Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,204

Claims priority, application United Kingdom, Aug. 22, 1977, 35167/77

Int. Cl.[2] H03B *3/04*; H03K *4/02, 4/08*; G01R *17/06*

U.S. Cl. 331—1 A **13 Claims**



1. Apparatus comprising:

first means for generating a first input signal having a ramp-like waveform;

second means for providing a second input signal;

comparison means for generating an output signal in response to said first and second input signals having a first level when the magnitude of said first input signal exceeds the magnitude of said second input signal and a second level when the magnitude of said second input signal exceeds the magnitude of said first input signal;

correction means for generating a correction signal representing the duration of one of said levels;

offset means for shifting one of said first and second input signals relative to the other in response to said correction signal to inhibit a change of said duration; and

utilization means for utilizing said output signal.

4,204,174
PHASE LOCKED LOOP VARIABLE FREQUENCY GENERATOR

Nigel J. R. King, Wokingham, England, assignor to Racal Communications Equipment Limited, England

Filed Nov. 9, 1978, Ser. No. 959,240

Claims priority, application United Kingdom, Jul. 22, 1978, 30779/78

Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—10 **8 Claims**

1. An electrical circuit arrangement for producing a variable frequency output, comprising:

a variable frequency source producing an output frequency;

an integrally adjustable frequency divider connected to receive the output frequency to produce a divided frequency;

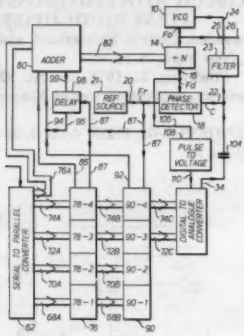
a reference frequency source;

a phase comparator connected to compare the phase of the

divided frequency with the phase of the reference frequency whereby to produce an output whose sign and level depend on the phase difference;

means feeding the output of the phase comparator to the variable frequency source to control its output frequency in a sense tending to reduce the said phase difference to zero;

means for periodically varying the division factor of the divider whereby its average value is such that the output frequency has a desired value;



means operative within each period of variation of the division factor to cause repeated and temporary shifts in the phase of the divided frequency with respect to the reference frequency whereby to offset the effect on its output signal which the phase differences detected by the phase detector up to that shift would otherwise have; and

means for offsetting the residual variations of the output signal of the phase detector between the said shifts.

4,204,175

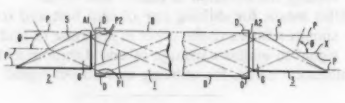
SLAB LASER ASSEMBLY

Gary D. Baldwin, Columbia, and Robert W. Rampolla, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1978, Ser. No. 870,899

Int. Cl.² H01S 3/06

U.S. Cl. 331—94.5 D **6 Claims**



1. A laser assembly comprising, a rectangular parallelepiped laser slab having a pair of optically polished longitudinal internal reflection faces extending between flat right-angled opposite ends through the centers of which a longitudinal axis of symmetry of said slab passes,

said slab having input and output radiation beam paths aligned with said longitudinal axis of symmetry exteriorly of said slab at its opposite ends, respectively, and

Brewster angle coupling prism members disposed adjacent to said opposite ends, respectively,

one of said members being operative to transform said input radiation beam path into divided criss-crossing beam paths in presentation to one of said opposite ends and another said member being operative to reunite and transform internally-reflected criss-crossing beam paths arriving at the other of said opposite ends into said output radiation beam.

4,204,176

VARIABLE EQUALIZER

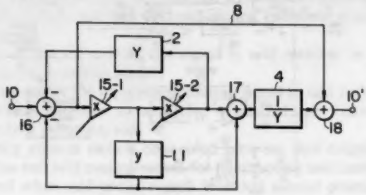
Yoshitaka Takasaki, Tokorozawa; Yasuhiro Kita, Hachioji; Junichi Nakagawa, Tokorozawa, and Kohei Ishizuka, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 3, 1978, Ser. No. 893,014

Claims priority, application Japan, Apr. 18, 1977, 52-43561

Int. Cl.² H03H 7/14

U.S. Cl. 333—28 R **5 Claims**



1. A variable equalizer comprising:

a forward pass circuit in which a variable amplifier having no frequency-dependency and a first circuit having an inverse characteristic to a reference frequency characteristic are arranged in the order mentioned between an input and an output of said variable equalizer,

a feed back pass circuit which feeds back part of an output of said variable amplifier to an input thereof and which has said reference frequency characteristic, and

a feed forward pass circuit which adds part of said input of said variable amplifier to an output of said first circuit and which has no frequency-dependency.

4,204,177

NON-RECURSIVE DIGITAL FILTER WITH REDUCED OUTPUT SAMPLING FREQUENCY

Ludwig D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

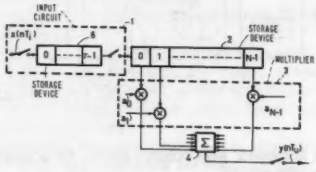
Continuation of Ser. No. 631,384, Nov. 12, 1975, abandoned.

This application Feb. 10, 1977, Ser. No. 767,549

Claims priority, application Netherlands, Dec. 18, 1974, 7416479

Int. Cl.² H03H 7/28; H03K 5/156; G11C 19/00, 21/00

U.S. Cl. 333—166 **10 Claims**



1. A non-recursive digital filter for generating digital-coded output samples which occur at a given output sampling frequency (f_w) and which are related in a predetermined way to a sequence of digital-coded input samples occurring at an input sampling frequency (f_i), the input sampling frequency being a multiple (r) of the output sampling frequency comprising:

a first storage device arranged to store a given number of successive input samples;

an input circuit for supplying successive input samples to said first storage device;

a multiplier;

means for supplying said input samples stored in said first storage device to said multiplier;

means for supplying weight factors which correspond to the

relationship between the input and output samples to said multiplier;

said multiplier forming sequentially a product of each of said N input samples and its corresponding weight factor;

an adder coupled to said multiplier and arranged to supply within one output sampling period ($1/f_u$), an output sample which is given by the mathematical sum of the products formed within that period;

said input circuit further comprising:

a second storage device arranged to store a group of input samples formed by a given number of successive input samples; and

means for writing said group of input samples into said first storage device synchronously with the occurrence of the output samples, the rapid writing of said group of input samples into said first storage device being made possible by first writing the input samples of which the said group consists sequentially into said second storage device.

4,204,178

ACOUSTIC WAVE DEVICES

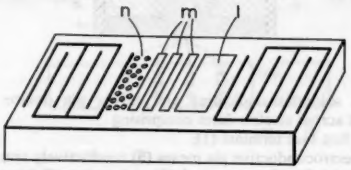
Richard F. Mitchell, Merstham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,116

Claims priority, application United Kingdom, Apr. 7, 1977, 14806/77; Feb. 20, 1978, 14806/78

Int. Cl.[2] H03H *9/02, 9/26, 9/32*

U.S. Cl. 333—194 **8 Claims**



1. An acoustic wave device comprising a substrate structurally orientated to enhance the propagation of acoustic surface skimming bulk waves in the substrate adjacent a predetermined surface of the substrate, said substrate having a pair of opposing end faces arranged to multiply reflect said waves propagating adjacent said surface so as to form a resonant cavity capable of supporting an acoustic surface skimming bulk standing wave at a predetermined frequency, a transducer disposed on said surface and within said cavity for coupling with acoustic surface skimming bulk standing wave energy at said frequency, and velocity reducing means provided at said surface in said cavity in addition to said transducer to reduce the velocity of said acoustic surface skimming bulk waves thereby enhancing the propagation of said waves, said velocity reducing means and said transducer extending over substantially the whole distance between said pair of end faces.

4,204,179

MECHANISM FOR CHANGING INDUCTANCE OF A PUSH-BUTTON TUNER

Takeshi Kataoka; Hiroshi Matsumoto, and Hisashi Matsui, all of Ueda, Japan, assignors to Ono Seiko Co., Ltd., Tokyo, Japan

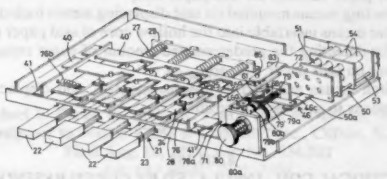
Filed Oct. 19, 1978, Ser. No. 953,969

Claims priority, application Japan, Oct. 29, 1977, 52-129854

Int. Cl.[2] H03J *5/06, 5/08, 5/32*

U.S. Cl. 334—7 **3 Claims**

1. A mechanism for changing inductance of a tuner comprising: a push-button assembly having a push-button plate provided with a push-button at one end and a coil spring received thereon at the other end thereof, which is arranged horizontally and slidably through rectangular holes disposed in the front and the rear walls positioned in parallel on a base respectively, and on which a channeling plate provided with a pair of projections is pivotably positioned, said channeling plate being retainable at a desired position by means of a retaining plate supported by a vertical wall positioned on the push-button plate, under which a sliding metal plate having a convexed cam thereon is arranged slidably in lengthwise direction of the push-button; a pair of sliding cam plates arranged horizontally and slidably through rectangular holes disposed in a pair of side walls arranged on the base at right angles to said front and rear walls, said sliding cam plates being provided with cam portions with which the projections for the channeling plate are collidable intermittently when the push-button plate is advanced by the depression of the push-button hereby to permit the sliding cam plate to be shifted conversely through a rotation means; a rotation means formed in a letter T having a pair of depending studs engageable with slits arranged in the portions of the sliding cam plates protruding through holes arranged in one of the vertical walls and another depending stud also engageable with a hole for a core carriage foot; a rotation shaft provided with a pointed end and an annular ring formed integrally therewith being connected with the rotation means by the insertion of said pointed end through a hole positioned in the center between said pair of depending studs with the under surface of said annular ring touching with the surface of the rotation means; a core carriage comprising a vertical wall having holes for horizontal guide shaft, a foot provided with a hole at its end with which one of the depending studs of the rotation means being engageable and a plurality of cores horizontally mounted thereon, said core carriage being so arranged slidable back and forth corresponding to the sliding movement of the sliding cam plates through the rotation means and the rotation shaft connected with each other as to allow the cores to be shiftable with respect to coil bodies arranged at the back of the core carriage with the resultant changing of inductance of the tuner; a clutch sliding plate provided with cam portions at front portion thereof being arranged horizontally and slidably through the side walls so that the end portion thereof may slide along the under surface of an end cam portion of an L-shaped lever plate mounted on a bracket, against the biasing force of coil spring positioned on the clutch sliding plate hereby to lift up or tilt the lever plate away from the base when a depending foot of the push-button plate engages with a cam portion of the clutch sliding plate by the forward advancement of the push-button, with the resultant declutching of a clutch mechanism; and a manual tuning shaft mounted on a hanger plate the rotation of which is transmitted, through two meshing gears disposed at the end of manual shaft and worm gear shaft, respectively, to a worm gear shaft which is in meshing engagement with a gear or a gear wheel constituting a part of the clutch mechanism, the gear wheel being arranged rotatable simultaneously with the rotation means by means of the manual tuning shaft, whenever the clutch mechanism is closed, through other members of the clutch mechanism, hereby to permit the sliding cam plates to be shifted conversely.

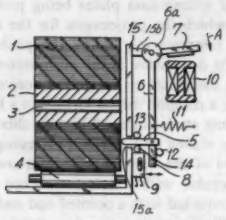


4,204,180

END OF PAPER ROLL DETECTION ASSEMBLY

Kiyofumi Usui; Chihiro Otsuki, and Sadaharu Inukai, all of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 24, 1978, Ser. No. 889,673
Claims priority, application Japan, Mar. 24, 1977, 52-35786
Int. Cl.[2] H01H *9/00*; G08B *21/00*; B65H *25/00*
U.S. Cl. 335—205 **13 Claims**



1. An end of a paper roll detecting assembly for detecting a predetermined amount of paper remaining on a paper roll having a hollow core comprising:

a frame;

paper roll support means for holding said paper roll;

displacing means adapted to be displaced between a first position away from said paper roll and a second position towards said paper roll when the predetermined amount of paper remains on said paper roll;

detecting means mounted on said displacing means including bar means insertable into the hollow core of said paper roll for detecting the predetermined amount of paper remaining on said paper roll; and

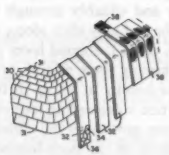
switch means actuated by displacement of said displacing means to said second position.

4,204,181

ELECTRICAL COIL, INSULATED BY CURED RESINOUS INSULATION

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 680,633, Apr. 27, 1976, Pat. No. 4,137,275. This application Oct. 30, 1978, Ser. No. 956,125
Int. Cl.[2] H01F *27/32*
U.S. Cl. 336—96 **7 Claims**



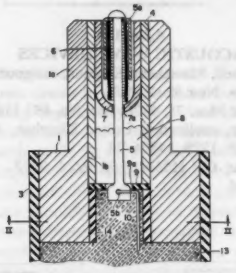
1. An insulated electrical coil having a cured body of resinous insulation applied to the coil, the insulation comprising a cured resinous composition consisting essentially of (1) 100 parts by weight of an epoxy resin mixture consisting essentially of: a first epoxy resin consisting of a diglycidyl ether of an aliphatic diol and a second epoxy resin selected from the group consisting of bisphenol A epoxy resins, bisphenol F epoxy resins, novolac epoxy resins, glycidyl ester epoxy resins, hydantoin epoxy resins, cycloaliphatic epoxy resins and mixtures thereof, (2) about 25 parts to 200 parts by weight of an organic carboxylic acid anhydride and (3) 0.002 part to 1.00 part of a metal acetylacetonate selected from the group consisting of chromium (III) acetylacetonate, titanyl acetylacetonate, aluminum (III) acetylacetonate, manganese (III) acetylacetonate, cobalt (II) acetylacetonate, cobalt (III) acetylacetonate, nickel (II) acetylacetonate, vanadium (III) acetylacetonate, zirconium (IV) acetylacetonate, sodium (I) acetylacetonate, potassium (I) acetylacetonate and mixtures thereof, acting as a latent catalyst.

4,204,182

INDICATING OR STRIKER PIN FOR ELECTRIC FUSES

Edward J. Knapp, Jr., Merrimac, Mass., assignor to Gould Inc., Ill.

Filed May 1, 1978, Ser. No. 901,471
Int. Cl.[2] H01H *85/30*
U.S. Cl. 337—244 **5 Claims**



1. A solderless indicating and striker pin device to be shunted across electric fuses comprising

(a) a first fuse terminal (1);

(b) electroconductive pin means (5) conductively connected to said first fuse terminal (1) and spring (6) biased in a direction longitudinally thereof;

(c) a partition (9) of electric insulating material extending transversely to said pin means (5) and defining a passageway for the passage of said pin means (5) from a first space to one side to a second space to the other side of said partition (9);

(d) a second fuse terminal (2) arranged in spaced relation from said first fuse terminal (1);

(e) a fusible element (10) conductively connected with one end thereof to said second terminal (2) and engaging with the other and thereof said pin means (5) on said other side of said partition (9); and

(f) the point of engagement of said fusible element (10) and said pin means (5) being the point of highest resistance of the current path extending between said first terminal (1) and said second terminal (2) so that a break of said fusible element (10) will be initiated at said point by the highest generation of heat at said point.

4,204,183

TAPERED STRAP ELEMENT FOR AN ELECTRICAL FUSE

Donald D. Blewitt, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 667,792, Mar. 17, 1976, abandoned. This application May 9, 1978, Ser. No. 904,349
Int. Cl.[2] H01H *85/08*
U.S. Cl. 337—295 **14 Claims**

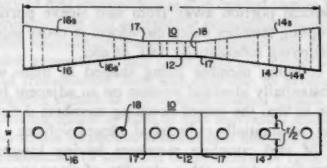
1. A current limiting fuse, comprising:

(a) fuse housing means;

(b) fuse terminal means disposed at either end of said housing means; and

(c) fuse element means, interconnected with said terminal means for interrupting electric current, said fuse element

means having outer surfaces which are substantially flat, the length of said fuse element means being significantly larger than the width thereof, the depth of said fuse element means being tapered along a significant portion of the length thereof, said width of said fuse element means being significantly larger at its smallest point than said depth is at its largest point.

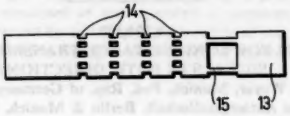


4,204,184

FUSE-ELEMENT FOR ELECTRIC FUSES

Tibor Csizy; Arpad Karpat; Janos Melis, and Zoltan Szemerey, all of Budapest, Hungary, assignors to Villamos Berendezés és Készülvék Müvek, Budapest, Hungary

Continuation of Ser. No. 687,542, May 18, 1976, abandoned.
This application Apr. 10, 1978, Ser. No. 894,837
Claims priority, application Hungary, May 19, 1975, VI 1044
Int. Cl.[2] H01H *85/10*
U.S. Cl. 337—295 **12 Claims**



1. A fuse element of an electric fuse for protecting a circuit comprising in combination:

a first portion having at least a first zone of reduced cross-section and predetermined length for being blown in response to a severe overload of relatively short duration, and

a second portion connected in series with said first portion and having a second zone of reduced cross-section and predetermined length for being blown in response to a moderate overload of relatively long duration, each of said portions being composed of a predetermined and substantially identical metal, the cross-section of said second zone being smaller, and its length longer than the corresponding cross-section and length of said first zone, respectively, whereby the protected circuit will be disconnected from a power supply through said first and second portions in response to said relatively short and severe, and said relatively long, and moderate overloads, respectively.

4,204,185

INTEGRAL TRANSDUCER ASSEMBLIES EMPLOYING THIN HOMOGENEOUS DIAPHRAGMS

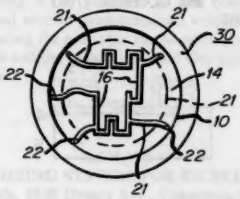
Anthony D. Kurtz, Englewood, and Richard A. Weber, Denville, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Oct. 13, 1977, Ser. No. 841,679
Int. Cl.[2] G01L *1/22*
U.S. Cl. 338—4 **6 Claims**

1. A transducer, comprising:

(a) an annular base member fabricated from a semiconductor material of a given conductivity, said annular member having a central aperture defining an active area; which aperture is characterized as being formed by a chemical capable of selectively etching said given conductivity semiconductor,

(b) a composite layer covering said aperture and comprising a first cover layer immediately above said aperture and fabricated from a highly doped conductivity layer, a second thicker layer located on said first layer and fabricated from a semiconductor material, and



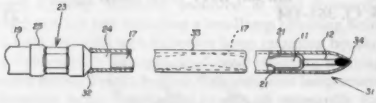
(c) at least one piezoresistive sensor element deposited on said second layer and within the area overlying said aperture whereby upon deflection of said composite layer, said element exhibits a resistance according to the magnitude of said deflection.

4,204,186

TEMPERATURE PROBE

Michael S. Parisi, and John A. Pauly, both of Milford, Mass., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Aug. 16, 1978, Ser. No. 934,031
Int. Cl.[2] H01C *7/02, 7/04*
U.S. Cl. 338—30 **9 Claims**



1. A temperature probe assembly comprising:

an elongated electrically conductive unitary housing defining a housing cavity and having a closed end and an open end;

a thermistor positioned within said housing cavity adjacent to said closed end and having first and second leads, said first lead being electrically connected to the interior surface of said closed end;

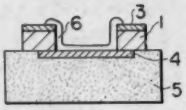
a resilient coaxial cable having an inner conductor connected to said second lead of said thermistor and an outer conductor insulated from said inner conductor and connected to said electrically conductive housing, said coaxial cable extending into said open end of said housing and being of greater length than said housing so as to be compressed into said housing cavity and longitudinally deformed thereby, said deformed cable exerting a force on said thermistor that maintains said first lead against said closed end; and

a coupling means securing said housing to said coaxial cable so as to prevent relative longitudinal movement therebetween.

4,204,187
PRINTED CIRCUIT SUBSTRATE WITH RESISTANCE ELEMENTS

Takeshi Kakuhashi, and Yasufumi Miyake, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Mar. 7, 1978, Ser. No. 884,298
Claims priority, application Japan, Nov. 14, 1977, 52-137155
Int. Cl.[2] H01C *1/012*
U.S. Cl. 338—307 7 Claims

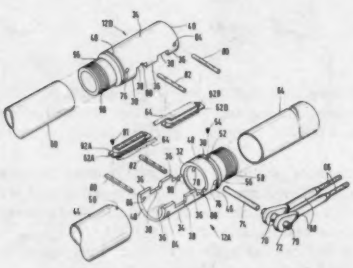


1. A printed substrate incorporating resistive elements comprising in combination:
(a) an insulating support;
(b) a layer of resistive material of predetermined dimensions embedded in said insulating support and having an outer surface flush with an outer surface of said insulating support;
(c) first and second regions of highly conductive material positioned in contact with spaced-apart portions of said layer of resistive material, said first and second regions of highly conductive material being positioned upon at least portions of said outer surface of said resistive layer; and
(d) first and second conductor pattern film layers formed on said first and second regions of highly conductive material respectively at a position opposite said layer of resistive material.

4,204,188
CABLE FOR SEA SEISMIC EXPLORATION

Helmut Weichart, Hanover, and Jürgen Schmidt, Husum, both of Fed. Rep. of Germany, assignors to Prakla-Seismos GmbH, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,220
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719951
Int. Cl.[2] G01V *1/00*; H04B *13/00*
U.S. Cl. 367-154 27 Claims

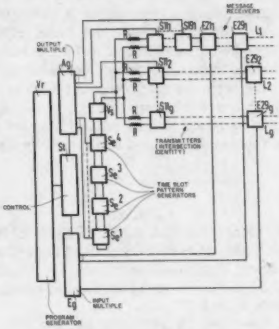


1. A measuring cable for use in making seismic measurements in an ocean-like environment, the cable having a plurality of hose sections each comprising a hose jacket, a material within the hose jacket tending to contribute to the buoyancy thereof, internal means for supporting the shape of the hose jacket, a plurality of measuring elements within the hose jacket, electrical conductors for interconnecting the elements, and coupling means for interchangeably interconnecting the hose sections, each of said coupling means comprising
two substantially identical matable coupler halves each including
a sleeve portion connectable to one end of a hose jacket,
a tubular, substantially cylindrical portion fixedly attached to one end of said sleeve portion and having an axial opening, and
a semi-tubular coupling member extending from said cylindrical portion away from said sleeve portion, said coupling member being curviform in cross section and occupying substantially 180° of arc,
said coupling member being shaped to mate with the substantially identical portion on an adjacent hose section so that the joined coupling members define a hollow, substantially cylindrical, closed volume,
each of said coupling members having longitudinally extending edges with a plurality of alternating protrusions and recesses, said protrusions and recesses being rectangular in shape and overlapping a plane passing through the central axis of the joined halves and the mean connection lines between the joined halves;
a generally cylindrical tubular coupling jacket surrounding and tightly fitting over the joined coupling members;
connector means within the volume defined by said coupling means for interconnecting electrical conductors extending from within the hose sections to said coupling means;
at least one load cable extending longitudinally through each of said hose sections, such said load cable having end fittings attached to the coupler halves at opposite ends of the hose section;
each of said hose sections being provided with a coupler half at opposite ends thereof, said semi-tubular coupler members being open in substantially opposite radial directions.

4,204,189
SYSTEM FOR LONG DISTANCE TRANSMISSION OF SIGNALS IN BOTH DIRECTIONS

Reinhard Weyer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 599,488, Jul. 28, 1975, abandoned, which is a continuation of Ser. No. 395,052, Sep. 7, 1973, abandoned, which is a continuation of Ser. No. 213,019, Sep. 28, 1972, abandoned. This application May 1, 1978, Ser. No. 901,829
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1972, 2244173
Int. Cl.[2] G08G *1/07*
U.S. Cl. 340—40 3 Claims



1. A circuit arrangement for the transmission of signals in both directions for controlling traffic lights at a plurality of intersection installations on a time multiplex basis, said circuit arrangement comprising:
a central station and a plurality of individual stations remote from said central station for connection to and controlling

the traffic lights of a plurality of traffic light intersection installations;

a plurality of transmission lines each having one end connected to said central station and another end connected to a respective individual station;

a plurality of first transmitters in said central station for each transmission line and operable in respective frequencies to transmit intersection installation identification signals;

a time slot generator in said central station connected to all of said transmission lines and operable to produce time slot pattern signals as traffic light control signals;

first receiving means in each of said individual stations connected to the respective transmission line and operable at the frequencies of said first transmitters for receiving the installation identification signals;

second receiving means in each of said individual stations connected to the respective transmission line for receiving the time slot pattern traffic light control signals;

traffic light control means connected to said first and second receiving means and adapted for connection to the traffic light installations for controlling the traffic lights in accordance with the signals received by said first and second receiving means;

means connected to said first and second receiving means for checking the orderly receipt of the traffic control signals;

a second transmitter in each of said individual stations connected to said checking means and to the respective transmission line for sending traffic signal messages indicating the received signals back to said central station; and

third receiving means in said central station connected to the respective transmission lines for receiving said messages,

said traffic light control means comprising a plurality of switches connected to and operated in response to the signals received by said first and second receiving means, said switches including connections for operating the traffic lights.

4,204,190

BRAKE PAD WEAR DETECTION SYSTEM

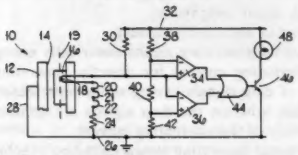
David Wiley, Brownhills, and David G. Williams, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 5, 1978, Ser. No. 966,724

Claims priority, application United Kingdom, Dec. 7, 1977, 51237/77

Int. Cl.[2] B60T 17/22

U.S. Cl. 340—52 A **5 Claims**



1. A brake pad wear detection system comprising a brake having a brake pad and a conductive braking face, the brake pad and the conductive braking face engaging during braking, a voltage supply line, an earth line, a first impedance means one end of which is connected to the voltage supply line, a second impedance means one end of which is connected to the earth line, a sensor loop connected in series between the first and second impedance means and embedded in the brake pad and positioned so as to be broken when the wear to the pad exceeds the working limit, indicator means and means connected to the common point of the first impedance means and the sensor loop for detecting if the potential at said common point is between first and second predetermined voltages, the detecting means operating the indicator means upon contact between the braking face and the sensor loop and also upon breakage of the sensor loop.

4,204,191

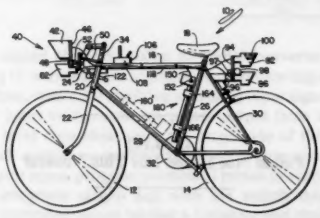
LIGHTING SYSTEM FOR BICYCLES

Travis J. Daniels, 1838 Dysart Ave., Columbus, Ohio 43219

Filed Apr. 7, 1977, Ser. No. 785,343

Int. Cl.[2] B62J 5/00

U.S. Cl. 340—134 **12 Claims**



1. A lighting system for bicycles having a frame with forwardly and rearwardly disposed portions, including handlebars for guidance, actuable brake means and a seat for providing operator support comprising:

a forward lighting assembly mounted at said forwardly disposed portion and including a headlamp retaining housing, a forward right turn indicator lamp retaining housing and a forward left turn indicator lamp retaining housing, each said forward right and left turn indicator lamp retaining housings being comfigured having an outwardly forwardly disposed lenticulated lens formed of a plurality of discrete lenticules formed as corner cubes which are arranged to protrude outwardly from each said indicator lamp, said assembly being mountable for turning movement with said handlebars;

a rearward lighting assembly mountable in stationary fashion rearwardly of said seat and including a stoplight retaining housing, a rearward right turn indicator lamp retaining housing and a rearward left turn indicator lamp and stoplight retaining housings being configured having an outwardly rearwardly disposed lenticulated lens formed of a plurality of discrete lenticules formed as corner cubes each of which is arranged to protrude outwardly from each said housing;

a battery power supply;

manually actuable switch means including first switch means actuable for energizing said headlamp from said power supply, second switch means manually actuable to a first position to effect the energization of said forward and rearward lighting assembly right turn indicator lamps, and manually actuable to a second position to effect the energization of said forward and rearward lighting assembly left turn indicator lamps, and third switch means manually

actuable to effect the dual energization of both said right and left turn indicator lamps of said forward and rearward lighting assembly, said manually actuable switch means being mounted within a switch housing fixedly mountable upon said frame in the vicinity of said handlebars for providing manual access thereto by said operator;

an illumination network including an oscillator circuit responsive to said actuation of said second switch means into said first and second positions and to said actuation of said third switch means to effect said respective right turn indicator lamps, said left turn indicator lamps and said both right and left turn indicator lamps energization in oscillatory fashion from said battery power supply;

housing means for retaining said battery power supply and illumination network, removably mountable upon said frame and including electrical connector means accessible externally of said housing means and electrically connected with said illumination network and said battery power supply; and

a wiring harness mounted with said frame and effecting electrical communication between said forward lighting assembly, said rearward lighting assembly, said manually actuable switch means within said switch housing, said batter power supply and said illumination network and including a connector manually removably connectable with said housing means electrical connector me·ns.

4,204,192
Patent Not Issued For This Number

4,204,193
ADAPTIVE ALIGNMENT FOR PATTERN RECOGNITION SYSTEM

Eugene N. Schroeder, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,634
Int. Cl.² G06K 9/04
U.S. Cl. 340—146.3 H **9 Claims**

1. In a pattern recognition system including means for scanning a space to define discrete elemental areas for recognition of individual patterns, said system including means for associating said areas with respective signal levels corresponding to a measured characteristic, the improvement characterized by:

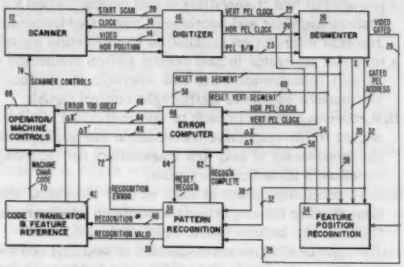
means for identifying a pattern among a predefined set of recognizable patterns, said identifying means including means for storing pattern identity information for respective members of said set of recognizable patterns based on a predefined alignment in the scanning space and means for comparing the identity information with said signal levels to identify a recognizable pattern from said set thereof;

means for measuring the coordinates of one or more selected alignment features based on said signal levels for the respective areas;

means for storing ideal feature alignment coordinates for each recognizable pattern;

means for computing the differences between the measured feature coordinates and the ideal feature coordinates for a recognizable pattern that has been identified by said identifying means; and

means for adjusting the coordinates of a subsequent space for scanning in accordance with said coordinate differences to

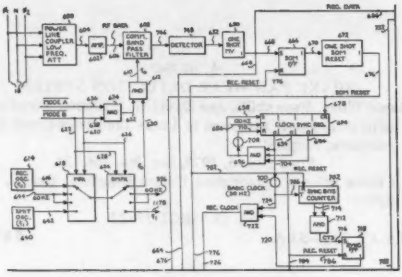


enhance the pattern alignment capabilities of the pattern recognition system.

4,204,194
METER TERMINAL UNIT FOR USE IN AUTOMATIC REMOTE METER READING AND CONTROL SYSTEM

Anthony P. Bogacki, Chester, N.H., assignor to General Electric Company, Somersworth, N.H.

Division of Ser. No. 799,550, May 23, 1977, Pat. No. 4,161,720.
This application Apr. 24, 1978, Ser. No. 899,873
Int. Cl.² H04M 11/04
U.S. Cl. 340—147 SY **4 Claims**



1. Apparatus for synchronizing a serial stream of data signals with a clock signal comprising;

(a) a source of alternating current

(b) data signal generating means electrically energizable by said alternating current for directly generating a serial stream of data signals having states representative of binary data wherein the data signals are generated asynchronously of the alternating current;

(c) clock signal generating means including synchronization means electrically responsive to said alternating current and said data signals to provide a repetitively occurring clock signal which is synchronized with said data signals; and

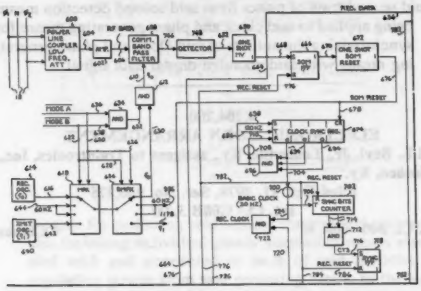
(d) means for combining said clock signal and said data signals whereby said data signals are provided as binary data synchronized by said clock signal.

4,204,195

METER TERMINAL UNIT FOR USE IN AUTOMATIC REMOTE METER READING AND CONTROL SYSTEM

Anthony P. Bogacki, Chester, N.H., assignor to General Electric Company, Somersworth, N.H.

Division of Ser. No. 799,550, May 23, 1977, Pat. No. 4,161,720.
This application Apr. 24, 1978, Ser. No. 899,728
Int. Cl.[2] H04Q 11/00; H04M 11/04
U.S. Cl. 340—151 3 Claims



1. In a meter terminal unit of the type for use in an automatic meter reading system, the combination comprising:

(a) a source of alternating current,

(b) a meter including a readable encoder electrically energizable by said alternating current for directly generating a serial stream of data signals having binary states representative of a meter measurement wherein the data signals are generated asynchronously of the alternating current;

(c) clock signal generating means including synchronization means electrically responsive to said alternating current and said data signals from said encoder to provide a repetitively occurring clock signal which is synchronized with said data signals; and,

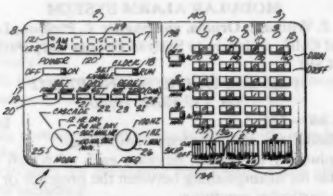
(d) means for combining said clock signal and said data signals whereby said data signals are provided as identifiable measurement data synchronized by said clock signal.

4,204,196

MODULAR ELECTRONIC TIMER

Michael P. Sveda, 25 Fallen Oaks Dr., Thousand Oaks, Calif. 91360

Filed Nov. 17, 1978, Ser. No. 961,492
Int. Cl.[2] H01H 43/00
U.S. Cl. 340—309.4 10 Claims



1. A modular electronic timer comprising:

a common bus;

circuit means for generating and applying to the common bus a plurality of parallel pulse signals that in combination define a timing interval divided into a sequence of time slots;

a plurality of independently operable decoders connected to the common bus so that all the decoders continuously monitor the parallel pulse signals; and

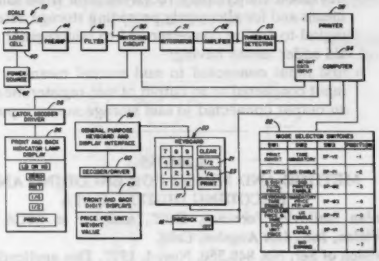
each of the independently operable decoders including gating means operable to produce an output command signal, and manually adjustable means for completing a plurality of signal flow paths from the common bus to the gating means to cause the gating means to produce the output command signal during a selected one of the time slots.

4,204,197

DIGITAL SCALE

Richard C. Loshbough, and Edward G. Pryor, both of Westerville, Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Aug. 15, 1977, Ser. No. 824,858
Int. Cl.[2] H03K 13/20; G01G 19/413
U.S. Cl. 340—347 NT 17 Claims



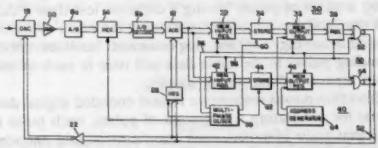
1. In a digital scale an analog to digital converter means comprising in combination an integrator means having an input and an output, means for applying an analog input signal to the integrator input to drive the integrator output from a datum level to a level dependent upon the magnitude of the analog input signal, switch means for applying a reference signal to the integrator input, program controlled means interconnected with the integrator output and with the switch means, the program controlled means having a counting and timing program loop of instructions of fixed duration for counting the excursions around the loop during the time required for the reference signal to drive the integrator output back to a predetermined level near the datum level.

4,204,198

RADAR ANALOG TO DIGITAL CONVERTER

Andree N. Filipov, Silver Spring; Richard N. Johnson, Gaithersburg, and Christopher N. Winslow, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1977, Ser. No. 862,319
Int. Cl.[2] H03K 13/02
U.S. Cl. 340—347 AD 2 Claims



1. Apparatus for conversion of a present analog radar signal to a K-bit digital form, comprising:

(a) first means receiving said analog radar signal for generating a signal repesenting a change from a previous point in time in said analog radar signal,

(b) said first means having digital-to-analog conversion means therein,

(c) second means connected to said first means and receiving the signal generated thereby for converting said signal generated by said first means to an N-bit digital signal

representing said change in said analog radar signal where N is less than K,

(d) adder means receiving a K-bit digital signal representing a previous point in time and said N-bit digital signal for adding said N-bit digital signal to said K-bit digital signal and for providing an updated K-bit digital output signal representative of said current analog radar signal,

(e) register means connected to provide an input to said adder means,

(f) storage means having an input and an output for storing a plurality of radar signals and being updated by said adder providing N-bit corrections to the data stored therein,

said storage means comprising first and second storage devices for alternately receiving data from said adder means and for alternately providing storage data to said digital-to-analog converter and to said register means,

(g) said adder means having:

a first input connected to said second means, a second input connected to an output of said register means, and an output connected to said storage means input.

4,204,199

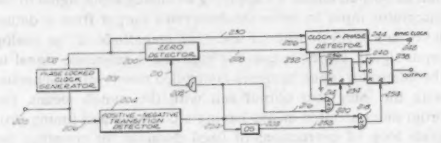
METHOD AND MEANS FOR ENCODING AND DECODING DIGITAL DATA

Jordan Isailovic, Torrance, Calif., assignor to MCA Disco-Vision, Inc., Los Angeles, Calif.

Division of Ser. No. 848,550, Nov. 4, 1977. This application Jul. 21, 1978, Ser. No. 927,256

Int. Cl.[2] G06F *3/00*

U.S. Cl. 340—347 DD **7 Claims**



1. An apparatus for decoding digital data present in a succession of data cell times, comprising:

a digital data source for supplying an encoded digital data signal changing between first and second levels spaced at variable length intervals, said transitions only occurring at the start of data cell time and at mid data cell time and no transitions occurring a one quarter data cell time and three quarter data cell time;

means for generating a clock signal having a repetition rate of twice the data cell time, said clock signal having a same predetermined direction of transition at both the start of data cell time and at mid data cell time;

clock and phase generating means responsive to said clock signal generating means for generating a plurality of separate phase timing signals, each of said phase timing signals being a series of pulses having a duration less than a data cell time and having a predetermined direction of transition and having a phase displacement between corresponding pulses in the same data cell time in each of said other separate phase timing signals;

first detection means responsive to said encoded digital data signal for generating a first train of pulses, each pulse in said first train identifies each transition in said encoded digital data signal;

second detection means responsive to said clock signal generating means and to said first detection means for generating a second train of pulses, each pulse in said second train identifies the end of data cell time of one of said encoded digital data signals having a duration of at least two consecutive data cell times having the same predetermined signal level;

first decoding means responsive to said clock and phase generating means and to the output of said first detection means for generating a first level decode signal containing transitions indicative of transitions in the encoded digital data signal which occur at mid data cell time;

second decoding means responsive to said clock and phase generating means and to the output of said first detection means and to the output of said first decoding means for altering said first level decoded signal to contain additional non-redundant transitions indicative of the second transition in pairs of transitions generated by said first detection means, which pairs of transitions are separated by a single data cell time; and

said second train of pulses from said second detection means being applied to said clock and phase generating means for synchronizing the outputs of said clock and phase generating means with said encoded digital data signal.

4,204,200

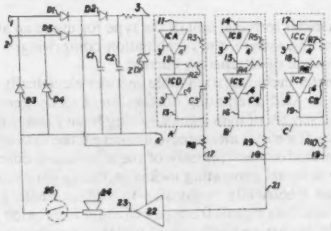
ELECTRONIC HORN ARRANGEMENT

Earl L. Beyl, Jr., Louisville, Ky., assignor to Traintronics, Inc., Goshen, Ky.

Filed Oct. 11, 1978, Ser. No. 950,275

Int. Cl.[2] G08B *3/00*

U.S. Cl. 340—384 E **4 Claims**



1. The invention claimed is a broad spectrum frequency varying horn arrangement which includes direct current power supply means, at least two wave signal generating oscillating circuit means adapted to provide square wave pulsed voltage output of selected amplitude and different fixed frequency, mixing means to additively mix the instantaneous output signals of each signal generating ocillator means to provide a stepwise varying output signal and amplifier means to receive the mixed signals of the oscillator circuit means, amplify said signal and transmit said signal to an audible sound generator means.

4,204,201

MODULAR ALARM SYSTEM

Stewart J. Williams, Orinda, and Shailer T. Pickton, Lafayette, both of Calif., assignors to Systron Donner Corporation, Concord, Calif.

Filed Dec. 19, 1978, Ser. No. 970,922

Int. Cl.[2] G08B *19/00*

U.S. Cl. 340—521 **14 Claims**

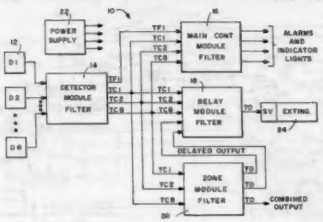
1. A modulized alarm system, comprising:

(a) a plurality of sensing devices, each of which includes means for distinguishing between the presence or absence of a particular condition;

(b) a detector module connected at its input to said sensing devices and having means including logic circuitry for producing an equal plurality of identical logit output signals indicative of and in response to the presence of said condition at said sensing devices, respectively, and filter means for preventing signals of predetermined maximum duration at its input from reaching its logic circuitry;

(c) a plurality of modules different from one another and from said detector module, each of said different modules being adapted for interconnection at its input with said detector modules and the other different modules by logic

output signals identical in kind to said logic output signals, each of said different modules having means including logic circuitry responsive to a logic output signal at its input for performing at least one particular function distinct from the other different modules and filter means for preventing signals of predetermined maximum duration at its input from reaching its logic circuitry; and



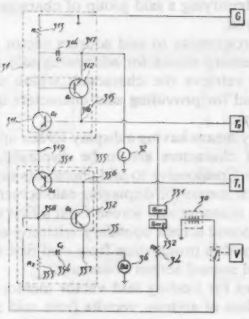
(d) means for powering said sensing devices and said modules including individual power regulating means associated with and connected to each of said modules for regulating power from said powering means to the logic circuitry of said associated module.

4,204,202

SECURITY ATTACHE CASE WITH AUTOMATIC ALARM SYSTEM

George C. Pai, No. 23, Lane 76, An-Ho Rd., Taipei, Taiwan

Filed Jul. 13, 1978, Ser. No. 924,444
Int. Cl.[2] G08B *13/14*
U.S. Cl. 340—571 **4 Claims**



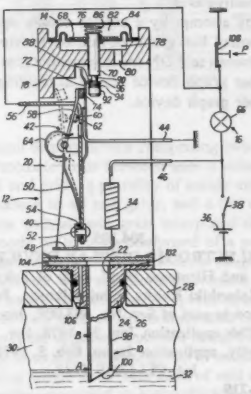
1. An attache case comprising:
a case body;
a handle for carrying the case, said handle being connected to said case body through pairs of metal studs;
a lock;
an inside container fixed to the bottom of the case body;
an alarm; and
alarm circuitry for generating alarm signals, said alarm circuitry including:
a setting circuit which consists of a first silicon controlled switch formed by a PNP and an NPN transistor, and an operating circuit which consists of a second silicon controlled switch formed by a PNP and an NPN transistor; said first and second silicon controlled switches having a common anode which is connected to a power supply through a switch and the cathodes of each silicon controlled switch being bypassed to ground through a resistor and a capacitor, the cathode gate of the first silicon controlled switch being used as a setting trigger point, and the cathode gate of said second silicon controlled switch being used as an operation trigger point, said alarm being connected between the cathode of said second silicon controlled switch and ground;
means for providing setting signals to said setting trigger point;
and means for providing alarm signals to said operation trigger point.

4,204,203

LEVEL INDICATOR

Michel Verne, Aubervilliers, France, assignor to Societe Anonyme DBA, Paris, France

Filed Jul. 21, 1978, Ser. No. 927,265
Claims priority, application France, Jul. 26, 1977, 77 22955
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—620 **11 Claims**



1. A level indicator for a liquid contained in a reservoir, comprising a tubular probe immersed in the liquid and opening to a depth which defines the minimum permissible level of said liquid in the reservoir, a gas pressure source including a housing which defines a gas-filled chamber communicating with said probe and means for increasing the pressure inside said chamber when said gas pressure source is activated, a locking device responsive to the variations of the pressure reigning inside said chamber and moving from a first position to a second position when said pressure rises above a predetermined value due to the liquid level in the reservoir being above said minimum permissible level and thus closing said tubular probe, and a warning device responsive to the position occupied by said locking device after said gas pressure source is activated, said warning device being brought into operation when the locking device then remains in its first position and out of operation as the locking device then reaches its second position.

4,204,204

ON/OFF SWITCH ARRANGEMENTS FOR A TOUCH CONTROL BAR GRAPH DEVICE

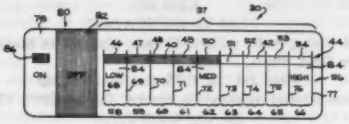
Martin H. Pitstick, Cleves, Ohio, assignor to General Electric Company, Louisville, Ky.

Filed May 25, 1978, Ser. No. 909,593
Int. Cl.[2] G08B *5/36*
U.S. Cl. 340—712 **29 Claims**

1. In combination with a touch control bar graph device, an ON/OFF switch arrangement comprising:
an ON touch-sensitive area positioned adjacent to but spaced from the touch control bar graph device;
a de-energizing touch-sensitive area positioned in the space

between said ON touch-sensitive area and the touch control bar graph device; and

circuit means responsive to said ON touch-sensitive area and to said de-energizing touch-sensitive area for enabling operation of the touch control bar graph device in response to the touching of said ON touch-sensitive area and for disabling operation of the touch control bar graph



device in response to the touching of said de-energizing touch-sensitive area;

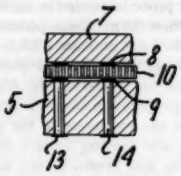
whereby any attempt by a user to enable operation of the touch control bar graph device by moving a finger directly between said ON touch-sensitive area and the touch control bar graph device results in disbling of the touch control bar graph device.

4,204,205

ELECTRONIC DISPLAY DEVICE

Kenjiro Yagi, and Hirotomo Hirai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 653,002, Jan. 28, 1976, abandoned. This application Jan. 24, 1978, Ser. No. 871,963
Claims priority, application Japan, Feb. 5, 1975, 50-15132
Int. Cl.[2] G02F 1/13
U.S. Cl. 340—719 **7 Claims**



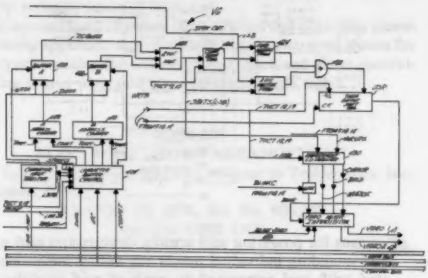
1. An electronic display device comprising: a display panel having front and rear major surfaces; a printed circuit board superposed beneath and spaced apart from the rear surface of said display panel; electrodes on the spaced-apart and facing major surfaces of said display panel and printed circuit board, wherein said electrodes on said rear major surface of said display panel have a certain width dimension and said electrodes on said facing major surface of said printed circuit board having a certain width dimension; a connector comprised of alternate segments of electrically conductive rubber and electrically non-conductive rubber alternately adjacently disposed along the width dimensions of said electrodes and extending in the direction normal to said electrodes between said electrodes for electrically connecting opposed ones of said electrodes on said facing major surfaces of said display panel and said printed circuit board, wherein said alternate segments of conductive and non-conductive rubber have a width dimension in the direction of the electrode width dimensions substantially less than the electrode width dimensions; and electronic circuitry mounted on said printed circuit board and being electrically connected to said electrodes for driving said display panel.

4,204,206

VIDEO DISPLAY SYSTEM

Richard E. Bakula, Indialantic, and Edward C. McCarthy, Indian Harbor Beach, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Aug. 30, 1977, Ser. No. 829,045
Int. Cl.[2] G06K 15/20
U.S. Cl. 340—721 **15 Claims**



1. Apparatus for displaying at least two groups of characters on different areas of a common video display screen, comprising:

main memory means for storing the characters which are to be displayed in each group of characters, said characters associated with each group being stored at addressable locations identified by a plurality of address vectors, said main memory means also storing lists of address vectors associated with each said group of characters to be displayed;

vector memory means for storing a selected list of address vectors identifying a said group of characters which is to be displayed;

first means responsive to said address vector stored in said vector memory means for addressing said main memory means to retrieve the characters which are to be displayed, and for providing said characters to a video display means;

video display means having a display screen upon which said groups of characters are to be displayed, said display means being responsive to said characters supplied thereto by said first means for displaying said screen in frames by cyclically scanning said screen from a first screen boundary to a second screen boundary whereby said characters are displayed in progression from said first screen boundary to said second screen boundary;

second means for loading said vector memory means with different lists of address vectors from said main memory means at least twice during each said scanning of said screen whereby at least two groups of characters are displayed in each said frame, said groups being displayed in progression and on different areas of said screen.

4,204,207

VIDEO DISPLAY OF IMAGES WITH VIDEO ENHANCEMENTS THERETO

Richard E. Bakula, Indialantic, and Edward C. McCarthy, Indian Harbor Beach, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

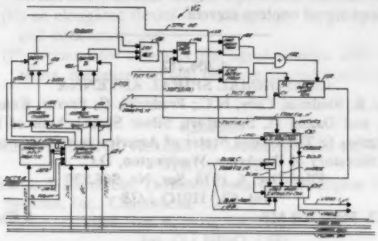
Filed Aug. 30, 1977, Ser. No. 829,043
Int. Cl.[2] G06K 15/20
U.S. Cl. 340—723 **8 Claims**

1. A video display system for displaying dot pattern images of data characters on a display screen with dot pattern modifications to the video characteristics thereof and comprising:

means for providing a plurality of coded data characters each representing a dot pattern image to be displayed and a like plurality of coded enhancement characters each representing one or more of a plurality of video dot pat-

tern modification enhancements with each said enhancement character being associated with only one of said data characters,

means responsive to each said coded data character for providing dot pattern video signals for forming the dot pattern image represented thereby,



means responsive to each said coded enhancement character for modifying the dot pattern video signals for the associated data character in accordance with the video dot pattern enhancement therefor as represented by said coded enhancement character, and

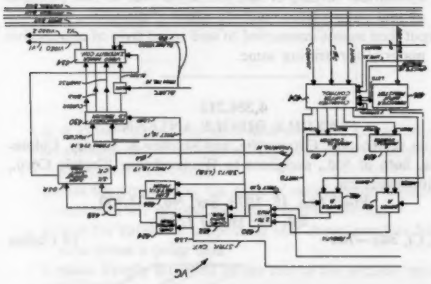
means responsive to said modified video signals for forming a video image with said video dot pattern enhancement.

4,204,208

DISPLAY OF VIDEO IMAGES

Edward C. McCarthy, Indian Harbor Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Aug. 30, 1977, Ser. No. 829,044
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—745 **12 Claims**



1. A video display system for displaying video images comprising:

means for supplying an associated pair of coded characters including first and second coded characters;

said second coded character representing a second graphical image, from a second set of related graphical images independent from said first set, to be displayed;

a plurality of storage means each storing video display instructions for forming each graphical image in one of said sets of related graphical images;

means responsive to said first and second coded characters for simultaneously obtaining from said plurality of storage means the respective video instructions for forming said first and second graphical images;

means for combining said video display instructions for forming said first and second graphical images; and

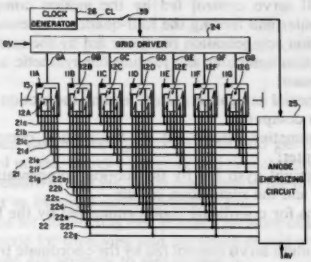
video display means responsive to said combined video display instructions for forming a graphical image having the combined video characteristics of said first and second graphical images.

4,204,209

FLUORESCENT DISPLAY DEVICE COMPRISING A PAIR OF ANODE CONNECTION GROUPS

Jun-ichi Suehiro, Izumi, Japan, assignor to Nippon Electric Kagoshima, Ltd., Izumi, Japan

Filed Nov. 7, 1978, Ser. No. 958,554
Claims priority, application Japan, Nov. 7, 1977, 52-133865
Int. Cl.[2] H01J *17/48*
U.S. Cl. 340—758 **5 Claims**



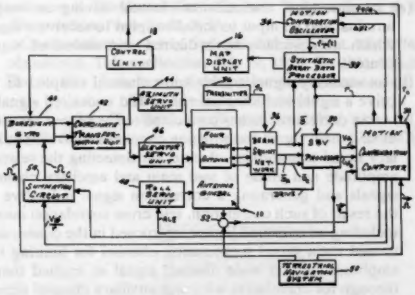
1. A fluorescent display device comprising two end grids, at least two intermediate grids between and in substantial alignment with said end grids, a plurality of anode units in one-to-one correspondence to all said grids, and a hot cathode over said anode units with all said grids interposed therebetween, each of said anode units being composed of a predetermined number of segmented fluorescent anodes arranged in a preselected configuration, wherein the improvement comprises a first group of anode connections for predetermined ones of said anode units with each of said connections connected to a prescribed one of the segmented anodes of each of said predetermined anode units and a second group of anode connections for the remaining anode units with each of said second-group anode connections connected to a preselected one of the segmented anodes of each of said remaining anode units, said predetermined anode units being every other one of all said anode units.

4,204,210

SYNTHETIC ARRAY RADAR COMMAND AIR LAUNCHED MISSILE SYSTEM

Eddy Hose, Fullerton, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 15, 1972, Ser. No. 288,243
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—6 R **2 Claims**



1. A synthetic array radar command air launched missile guidance system comprising:

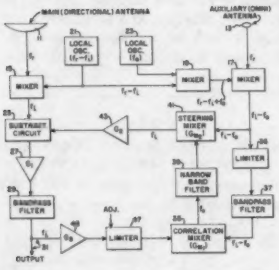
a. a four-quadrant antenna;

b. a radar transmitter;
c. a beam squint network fed by the four-quadrant antenna and the transmitter;
d. a single beam velocimeter fed by the beam squint network and having a feedback to the beam squint network;
e. a synthetic array data processor fed by the beam squint network;
f. a map display fed by the synthetic array data processor;
g. a motion compensation computer fed by the single beam processor;
h. a roll servo control fed by the motion compensation computer and feeding the four-quadrant antenna;
i. a motion compensation oscillator fed by the motion compensation computer and feeding the synthetic array data processor;
j. a terrestrial navigation system feeding the motion compensation computer;
k. a summation circuit fed by the motion compensation computer;
l. a boresight gyro fed by the motion compensation computer and the summation circuit;
m. means for coordinate transforming fed by the boresight gyro;
n. an azimuth servo control fed by the coordinate transforming means and feeding the four-quadrant antenna; and
o. an elevation servo control fed by the coordinate transforming means and feeding the four-quadrant antenna.

4,204,211
CONTROLLABLE SATURATION SIDELOBE CANCELLER

Arthur A. Cavelos, North Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Jun. 24, 1974, Ser. No. 482,078
Int. Cl.[2] G01S 3/06
U.S. Cl. 343—100 LE **3 Claims**

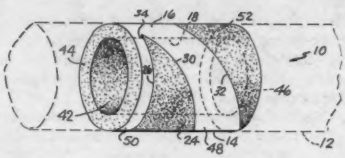


1. In a canceller:
(a) a main signal transmission channel having an output terminal and an input terminal coupled to receive a signal which may include both desired and undesired signal content;
(b) an auxiliary signal transmission channel coupled to receive a signal including primarily said undesired signal;
(c) cross correlaton means connected to the output terminal of said main signal transmission channel and to said auxiliary signal transmission channel for detecting the relative amplitude and phase of said main and auxiliary channel signals and generating a correlation signal indicative of the result of such correlation, said cross correlation means including an overload limiter interposed in the connection to said main signal transmission channel for limiting the amplitude of said main channel signal as applied therethrough for correlation with said auxiliary channel signal;
(d) a compensating cross feed network coupled to said auxiliary signal transmission channel to receive said undesired signal and to said cross correlation means to receive said correlation signal, said cross feed network being responsive to the signals coupled thereto to generate a correction signal of amplitude and phase corresponding to the undesired signal content of the main signal transmission channel as applied through said correlation limiter; and
(e) means interposed between said main channel input and output terminals for subtracting said correction signal from said main channel signal thereby to reduce the undesired signal content thereof.

4,204,212
CONFORMAL SPIRAL ANTENNA

Arthur R. Sindoris, Cary, N.C.; Frederick G. Farrar, Kensington, and Daniel H. Schaubert, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1978, Ser. No. 966,839
Int. Cl.[2] H01Q 1/38
U.S. Cl. 343—700 MS **9 Claims**

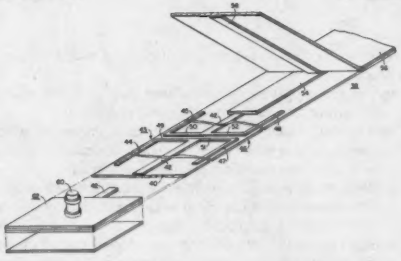


1. An electrically small microstrip antenna, which comprises:
a substantially cylindrical dielectric tube having inner and outer cylindrical surfaces;
a conductive ground plane formed on said inner cylindrical surface of said dielectric tube;
a strip of conductive material formed in a spiral on said outer cylindrical surface of said dielectric tube so that portions of said outer surface include exposed dielectric; and
input feed means connected to said spiral strip of conductive material for driving same.

4,204,213
FLEXIBLE DIPOLE ANTENNA

Myron S. Wheeler, Catonsville, and Stephen L. Creasy, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 15, 1978, Ser. No. 933,930
Int. Cl.[2] H01Q 1/28
U.S. Cl. 343—706 **15 Claims**



1. A flexible lightweight dipole antenna comprising:
(A) an elongated flexible substrate member;
(B) a layer of electrically conductive material disposed over said substrate member in a predetermined pattern which includes a first conductor extending along the length of said substrate member, and first and second dipole antenna elements respectively disposed on either side of, and con-

nected to, said first conductor and defining a first radiating and/or receiving element;

(C) a flexible, electrically insulating layer disposed over said first conductor;

(D) a second conductor positioned over said insulation layer and having a width which is less than the distance between said first and second dipole antenna elements;

(E) an elongated flexible covering layer covering said second conductor; and

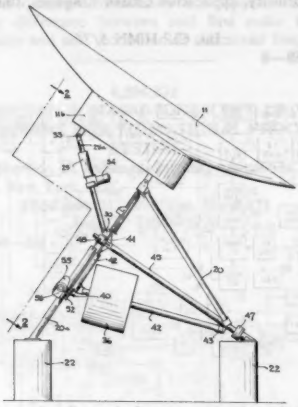
(F) a connector assembly for signal transfer with said antenna, connected to said first and second conductors.

4,204,214

SLEWING AND TRACKING MECHANISM FOR DISH STRUCTURE

Charles J. Fassnacht, Thousand Oaks, Calif., assignor to Datron Systems, Inc., Chatsworth, Calif.

Filed Nov. 6, 1978, Ser. No. 958,015
Int. Cl.² H01Q 3/00
U.S. Cl. 343—766 **8 Claims**



1. A drive mechanism for a dish structure comprising:

an azimuth drive member having an arcuate section forming a segment of a circle,

means for connecting the ends of said arcuate secsection to said dish for pivotal motion relative thereto,

means for rotatably supporting said drive member for rotation about a polar axis,

a chain fixedly attached to the rim of the arcuate section of said drive member,

a sprocket wheel,

means for rotatably mounting said sprocket wheel with the teeth thereof in engagement with said chain, and

means for rotatably driving said sprocket wheel to cause said drive member and said dish to be driven about a polar axis.

4,204,215

INK JET SYSTEM FOR ISSUING INK UNDER A PREDETERMINED UNIFORM PRESSURE IN AN INK JET SYSTEM PRINTER

Masazumi Nakarai, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Japan

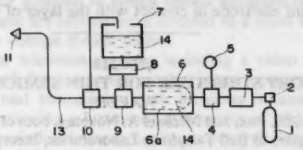
Filed Dec. 15, 1977, Ser. No. 860,959
Claims priority, application Japan, Dec. 17, 1976, 51-154769
Int. Cl.² G01D 15/18
U.S. Cl. 346—140 R **11 Claims**

1. An ink source device for an ink jet system including a nozzle for emitting ink liquid therefrom, said ink source device comprising:

a primary static pressure chamber for containing an ink liquid therein;

a gas pressure control means for generating a gas pressure of a predetermined fixed value;

said gas pressure control means being operatively connected to the primary static pressure chamber, and said primary pressure chamber being responsive to the predetermined



fixed gas pressure generated from said gas pressure control means, thereby applying said predetermined fixed gas pressure to said ink liquid contained in the pressure chamber as its initial supply pressure; and

means for connecting said primary pressure chamber to said nozzle for supplying said ink liquid of said predetermined fixed gas pressure to said nozzle.

4,204,216

ELECTRICALLY CONDUCTING DOPED POLYACETYLENE FILM EXHIBITING N-TYPE ELECTRICAL CONDUCTIVITY AND METHOD OF PREPARING SAME

Alan J. Heeger, Wynnewood; Alan G. MacDiarmid, Drexel Hill; Chwan K. Chiang, Upper Darby, and Shek-Chung Gau, Philadelphia, all of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Filed May 4, 1978, Ser. No. 902,666
Int. Cl.² H01L 29/28
U.S. Cl. 357—8 **27 Claims**

1. An electrically conducting polycrystalline film of polyacetylene, at least a portion of which is electron donor-doped to a controlled degree with a metal dopant whose Pauling electronegativity value is no greater than 1.6, said controlled degree of doping being such as to provide the electron donor-doped polyacetylene with a preselected room temperature n-type electrical conductivity ranging from that characteristic of semiconductor behavior to that characteristic of metallic behavior.

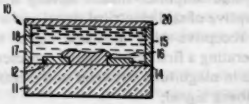
24. A semiconductor device including at least one p-n junction formed at least in part by electrically conducting film means comprising the polycrystalline film of claim 1.

4,204,217

TRANSISTOR USING LIQUID CRYSTAL

Lawrence A. Goodman, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 733,446, Oct. 18, 1976, abandoned. This application Jul. 19, 1978, Ser. No. 926,014
The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.
Int. Cl.² H01L 29/78, 49/02; G02F 1/13
U.S. Cl. 357—23 **11 Claims**



1. A transistor comprising

a first electrode;
a second electrode spaced apart from said first electrode;
a body of semiconductor material between and in contact with said first electrode and said second electrode;
an insulating substrate having thereon said first electrode, said second electrode and said body;
a layer of liquid crystal material in contact with and on the semiconductor body; and
a third electrode in contact with the layer of liquid crystal.

4,204,218

SUPPORT STRUCTURE FOR THIN SEMICONDUCTOR WAFER

William M. Fox, and Michael A. Novotny, both of Reading, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 1, 1978, Ser. No. 882,176
Int. Cl.[2] H01L *29/06*
U.S. Cl. 357—55 **3 Claims**

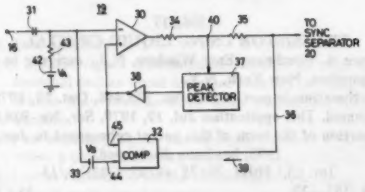
1. A semiconductor device comprising a semiconductor chip having two opposed, substantially parallel major surfaces, said chip having a thickness of less than about two mils and having a conductive electrode pattern on one major surface thereof, said conductive electrode pattern having a thickness dimension above said one major surface CHARACTERIZED IN THAT said one major surface includes a metal frame member encompassing said conductive electrode pattern and having a thickness of at least about twice the thickness of said pattern above said surface, said metal frame member constituting a support element providing mechanical strength and rigidity for said chip and having no electrical function relative to said device.

4,204,219

NOISE CANCELLATION CIRCUIT

Tomoaki Uchida, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 9, 1978, Ser. No. 932,291
Claims priority, application Japan, Aug. 12, 1977, 52-96629
Int. Cl.[2] H04N *5/21, 5/44*
U.S. Cl. 358—155 **9 Claims**



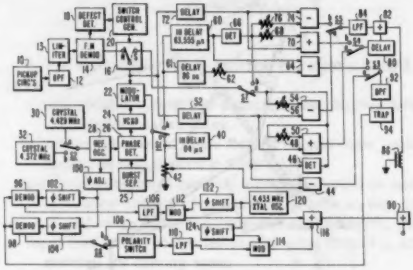
1. A circuit for cancellation of noise in an electrical signal, comprising:
differential amplifier means having a first input terminal receptive of said electrical signal and a second input terminal receptive of a feedback signal applied thereto for generating a first output signal representative of the difference in magnitude between said electrical signal and said feedback signal;
peak detector means connected to be responsive to said first output signal through a summation point for detecting a peak value of said electrical signal to generate a voltage signal representative of the detected peak value, said voltage signal being said feedback signal;
comparator means having a first input terminal connected to be responsive to said electrical signal and a second input terminal connected to be responsive to said feedback signal to provide a second output signal to said peak detector means through said summation point to produce an offset voltage thereat when the voltage at the first input terminal of the comparator is reduced to a level below the voltage at the second input terminal of said comparator; and
biasing means for biasing the first input terminal of said comparator means to a certain potential level with respect to the first input terminal of said differential amplifier means.

4,204,220

DUAL STANDARD VIDEO DISC PLAYER

Ernst A. O. Rutishauser, Widen, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,379
Claims priority, application United Kingdom, Jun. 24, 1977, 26626/77
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—8 **8 Claims**



1. In a dual-mode video record player for alternative use in (1) the playback of records bearing composite color video signals of a first type inclusive of a chrominance signal component and an accompanying color synchronizing component, wherein said chrominance signal component comprises modulated color subcarrier waves having a first color subcarrier frequency and said accompanying color synchronizing component comprises periodic bursts of oscillations of said first subcarrier frequency, and (2) the playback of records bearing composite color video signals of a second type inclusive of a chrominance signal component and an accompanying color synchronizing component, wherein said chrominance signal component comprises modulated color subcarrier waves having a second color subcarrier frequency and said accompanying color synchronizing component comprises periodic bursts of oscillations of said second color subcarrier frequency; said record player including signal pickup means for recovering composite color video signals from a record during playback operations; the combination comprising:
dual-mode oscillation generating means for developing reference oscillations of a first frequency when operating in a first mode and for developing reference oscillations of a second frequency when operating in a second mode; said generating means including switch means for selectively altering the generating means operating mode between said first and second modes;
a voltage controlled oscillator;
heterodyning means responsive to an output of said voltage controlled oscillator and to said recovered signals for developing an output inclusive of an up-converted chro-

minance signal component and accompanying color synchronizing component, with the color subcarrier frequency of said up-converted chrominance signal component and accompanying color synchronizing component corresponding in frequency to the difference between the output frequency of said voltage controlled oscillator and the color subcarrier frequency of the chrominance component and accompanying color synchronizing component of said recovered signals;

phase detector means responsive to said up-converted color synchronizing component and to reference oscillations developed by said generating means for developing an error voltage indicative of departures from a predetermined phase relationship between said up-converted color synchronizing component and said reference oscillations;

means for utilizing said error voltage to alter the operation of said voltage controlled oscillator in a sense opposing said departures; and

output signal forming means responsive to an output of said heterodyning means;

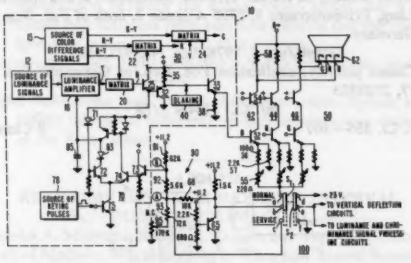
wherein the frequency difference between said first reference oscillation frequency and said second reference oscillation frequency substantially corresponds to the frequency difference between said first color subcarrier frequency and said second color subcarrier frequency.

4,204,221

PREDICTABLY BIASED KINESCOPE DRIVER ARRANGEMENT IN A VIDEO SIGNAL PROCESSING SYSTEM

Robert L. Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1979, Ser. No. 8,171
Int. Cl.² H04N 5/16
U.S. Cl. 358—34 **13 Claims**



1. In a video signal processing system including a video signal channel for processing an image representative video signal having periodically recurring image intervals, and blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness; bias supply means; a kinescope for reproducing images in response to video signals applied thereto; and kinescope driver means for coupling video signals from said channel to said kinescope; apparatus comprising:

comparator means having first and second inputs for comparing, during said blanking intervals, signals applied to said inputs to provide an output control signal indicative of the difference in magnitude between the input signals;

means for deriving a reference potential from said bias supply means;

means for coupling said reference potential to said kinescope driver means for providing a reference potential to which video signals amplified by said kinescope driver means are referenced;

adjustable voltage divider means coupled to said bias supply means, for providing an adjustable brightness control voltage;

means for coupling an adjustable brightness control voltage derived from said adjustable voltage divider means to said first input of said comparator means;

means for coupling video signals from said channel to said second input of said comparator means;

means for coupling said output of said comparator means to said channel, for varying said blanking level in a direction to reduce said difference to a minimum; and wherein

said reference potential to which signals amplified by said driver means are referenced is coupled to a point in said adjustable voltage divider means.

9. In a color television receiver including a video signal transmission path for processing a color image representative video signal, said transmission path including a luminance channel for processing a luminance component of said video signal having periodically recurring image intervals and image blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness, and a chrominance channel for processing a chrominance component of said video signal; bias supply means; means for combining signals processed by said luminance and chrominance channels; a kinescope for reproducing images in response to video signals applied thereto; and kinescope driver means for coupling combined video signals from said combining means to said kinescope; apparatus comprising:

a source of keying signals coincident with a portion of said blanking interval containing said blanking level;

comparator means responsive to said keying signals and having first and second inputs for comparing, during said portion of said blanking intervals, signals applied to said inputs to provide an output control signal indicative of the difference in magnitude between said input signals;

means for deriving a reference potential from said bias supply means;

means for coupling said reference potential to said kinescope driver means for providing a reference potential to which signals amplified by said kinescope driver means are referenced;

adjustable voltage divider means coupled to said bias supply means, for providing an adjustable brightness control voltage;

means for coupling an adjustable brightness control voltage derived from said adjustable voltage divider means to said first comparator input;

means for coupling output signals from said combining means to said second comparator input;

means for coupling said output of said comparator means to said video signal transmission path, for varying said blanking level in a direction to reduce said difference to a minimum; and wherein

said reference potential to which signals amplified by said driver means are referenced is coupled to a point in said adjustable voltage divider means.

4,204,222

HIGH OUTPUT LED MATRIX COLOR TV SCREEN WITH VERTICAL TRIAD AND TRICOLOR FACEPLATE

Antoine Zacharie, C.P. 100, 74 Rue Zacharie, Sacre-Couer, Saguenay, Quebec, Canada (G0T 1Y0)

Filed Jun. 19, 1978, Ser. No. 916,712
Int. Cl.² H04N 9/30
U.S. Cl. 358—59 **6 Claims**

1. A digital scanning colour television video screen having a plurality of conductors arranged in a matrix forming a plurality of crosspoints with each crosspoint including a separate source of light energizable via the matrix to form an image, the screen comprising:

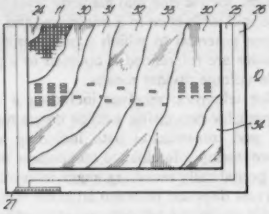
a plurality of horizontal conductors arranged in groups of three conductors each, said groups being disposed vertically across the screen in uniformly spaced relation with each group corresponding to a single horizontal scan line;

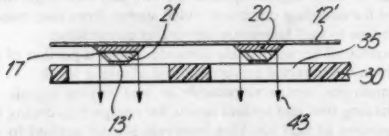
a plurality of vertical conductors disposed horizontally across the screen in uniformly spaced relation to form the

matrix, the intersection of the conductors of each horizontal scan line with a single vertical conductor forming a vertically disposed plurality of crosspoint triads;

light-emitting diode means connected across each crosspoint, each said means having a junction that is energizable via the matrix to emit white light and which is disposed relative to its crosspoint to provide an unobstructed path for incident light emitted by said junction; and

tricolour faceplate means having disposed thereon a plurality of colour triads corresponding to the crosspoint triads and aligned in overlying registry therewith.





4,204,223

METHOD AND APPARATUS FOR MAKING COLOR CORRECTIONS IN THE MANUFACTURE OF PRINTING PLATES

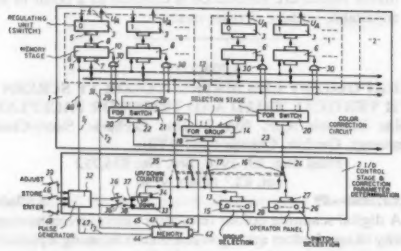
Uwe Gast, Rammsee; Dennis Kiralfy, Quickborn; Klaus Schaefer, Rendsburg; Eckhard Slawik, Grafing, and Klaus Wellendorf, Heikendorf, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 912,097

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2725864

Int. Cl.² G03F 3/00

U.S. Cl. 358—80 **6 Claims**



1. Apparatus for color correction in the manufacture of printing forms comprising a correction circuit including a group selection stage, means for energizing the group selection stage to select a particular group and at least two setting members in each group, selection stages associated with each group, means for energizing the selection stages to select a particular setting member in the group, said setting members receiving the signals to be corrected and having at least two registers for storing the digital adjusting values, a storage medium for storing said digital adjusting values, transfer means connected to the setting members and said storage means and computer means operately connected to said stages, said energizing means and said transfer means.

2. The method of color correction in the manufacture of printing forms wherein a correction circuit is used to determine adjusting values for each correction parameter and such values are used in correction circuit for the color correction process and wherein the determination and correction are separate processes, wherein for each correction parameter in the correction circuits there is provided a setting member mounted in the path of a signal to be corrected, said setting members being controlled by stored digital adjusting values, varying said signals in an analog manner in dependence of said digital adjusting values, adjusting the setting members of a correction circuit to the digital adjusting values which result in a desired correction, transferring the digital adjusting values determined in the correction circuit into a storage medium outside of the correction circuits for a later use, and feeding said stored digital adjusting values for an actual color correction to at least one correction circuit and storing them in the associated setting members of said correction circuit, and said process being controlled by computer means.

4,204,224

PROCESS AND APPARATUS FOR MEASURING THE LENGTH OF MOVING SHAPED ARTICLES PARTICULARLY RED-HOT SEMIFINISHED ARTICLES

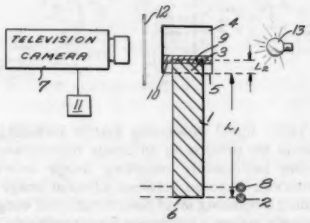
Gunther Buken, Im Börner 41, 6462 Geinhausen 2, and Raimund Lang, Friedenstrasse 5, 8755 Alzenau 2, both of Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,840

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725353

Int. Cl.² H04N 7/18

U.S. Cl. 358—107 **8 Claims**



1. A process for the non-contact measurement of the length of a moving shaped body wherein there is provided a high-speed television camera for scanning the body, providing a window, providing a slotted diaphragm and a counter, said process comprising triggering a starting signal by the side of the shaped body which lies in the direction of movement, said starting signal triggering said camera which is aligned on said window, said window being located at a distance l_1 from the point where the starting signal is triggered and determining the length l_2 of the end of the moving shaped body which projects into the window by means of the slotted diaphragm which is moving at a high rate of speed and the counter connected to said slotted diaphragm by stopping the counter when the slotted diaphragm reaches the edge of the shaped body, in which the sum of l_1 and l_2 gives the total length of the moving body.

4,204,225

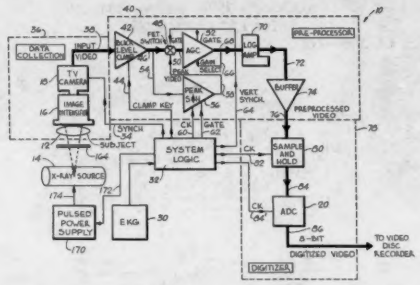
REAL-TIME DIGITAL X-RAY SUBTRACTION IMAGING

Charles A. Mistretta, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 906,686, May 16, 1978, abandoned. This application Nov. 15, 1978, Ser. No. 960,830

Int. Cl.[2] H04N 5/32

U.S. Cl. 358—111 65 Claims



1. A method of producing visible difference images derived from an X-ray image of an anatomical subject, comprising

the steps of directing X-rays through the anatomical subject for producing an X-ray image,

converting said X-ray image into television fields comprising trains of analog video signals,

converting said analog video signals into digital video signals,

producing integrated digital video signals by integrating said digital video signals over a predetermined time interval corresponding to a plurality of successive television fields,

producing digital difference video signals by performing a substraction between the digital video signals for a selected time different from said time interval and the corresponding integrated digital video signals,

converting said digital difference video signals into analog difference video signals,

and converting said analog difference video signals into visible television difference images representing changes in the X-ray image.

4,204,226

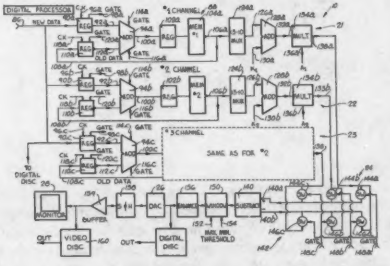
REAL-TIME DIGITAL X-RAY TIME INTERVAL DIFFERENCE IMAGING

Charles A. Mistretta; Robert A. Kruger, and Theodore L. Houk, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 16, 1978, Ser. No. 906,631

Int. Cl.[2] H04N 5/32

U.S. Cl. 358—111 35 Claims



1. A method of producing visible difference images derived from an X-ray image of an anatomical subject,

comprising the steps of directing X-rays through an anatomical subject to produce an X-ray image,

converting said X-ray image into series of television fields comprising trains of analog video signals,

converting said analog video signals into corresponding digital video signals,

integrating said digital video signals over a series of successive time intervals each corresponding with a plurality of successive television fields and thereby producing a series of successive separate sets of integrated digital video signals,

performing a series of successive subtractions between each successive separate set of integrated video signals and the immediately preceding set of integrated video signals and thereby producing a series of successive separate sets of digital difference video signals,

converting said digital difference video signals into analog difference video signals,

and converting said analog difference video signals into a series of successive visible television difference images representing changes in the X-ray image between the successive time intervals.

4,204,227

TELEVISION PICTURE COMPRESSOR

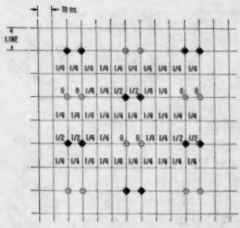
Thomas M. Gurley, Maple Shade, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,180

Claims priority, application United Kingdom, Mar. 21, 1977, 11904/77

Int. Cl.[2] H04N 9/02, 5/22

U.S. Cl. 358—138 18 Claims



1. A color television picture compressor for reducing the size of the television picture in the raster for use with a video synchronizer of the type which samples the incoming video signal at a frequency n times as high as the color subcarrier and normally provides a predetermined number of samples per line and lines per field for a full field raster, comprising:

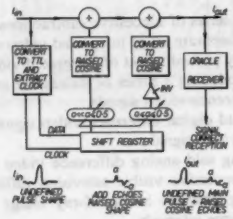
means coupled to said video synchronizer for deleting samples per line and lines per field for compressing the picture in the television raster and

means for averaging the surrounding picture samples to be deleted of the same color subcarrier phase into the value of the compressed picture sample to be maintained to thereby reduce the size of the picture while reducing the moire pattern.

4,204,228
DIGITAL TESTING APPARATUS

Arthur G. Mason, Chandlers Ford, and Peter R. Hutt, Petersfield, both of England, assignors to Independent Broadcasting Authority, London, England

Filed May 9, 1978, Ser. No. 904,291
Claims priority, application United Kingdom, May 10, 1977, 19609
Int. Cl.² H04N 5/00, 9/62
U.S. Cl. 358—139 **41 Claims**



1. Apparatus for producing a test signal having a predetermined amount of distortion, comprising

(a) means (10, 11) for generating a plurality of first pulses;

(b) delay means (17) for deriving from said first pulses a plurality of distortion pulses having an amplitude proportional to the amplitude of the first pulses;

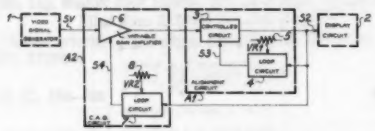
(c) attenuation means (22) for controlling the amplitude of the distortion pulses; and

(d) adder circuit means (23) for adding the distortion pulses to the first pulses, whereby the distortion pulses are added in spaced relation to the first pulses.

4,204,229
VIDEO CONTRAST EXPANDING ARRANGEMENT

Philippe Heuze, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 17, 1978, Ser. No. 952,126
Claims priority, application France, Oct. 21, 1977, 77 31740
Int. Cl.² H04N 5/52
U.S. Cl. 358—169 **11 Claims**

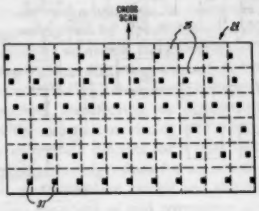


1. Arrangement for expanding the contrast of a video signal intended for an image display, by extending the signal in a contrast range defined between a first and a second potential level, comprising: means for aligning the video signal with the first level which are formed by an aligning circuit which is inserted in the video chain via a first input and an output and which receives at a second input a first control signal produced by a first detecting circuit, and means for aligning the video signal with the second level which are connected to the output of the aligning circuit and which are formed by an automatic gain control (AGC) circuit which is inserted in the video chain via a first input and an output and which receives at a second input a second control signal produced by a second detecting circuit, the control signals being a function of the peak variations in the video signal relative to respective ones of the alignment levels, the said detecting circuits each forming part of servo loop circuits which supply the respective control signals, a first loop circuit being connected between the second input and the output of the aligning circuit and the second loop circuit being connected between the second input of the AGC circuit and a point of connection to the video chain corresponding to the output of the arrangement.

4,204,230
HIGH RESOLUTION INPUT SCANNER USING A TWO DIMENSIONAL DETECTOR ARRAY

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1978, Ser. No. 954,507
Int. Cl.² H04N 3/14
U.S. Cl. 358—213 **28 Claims**



1. An input scanner comprising the combination of

a two dimensional array of photosensitive detectors, said detectors having respective photosensitive zones which are laterally offset from one another in a line scanning direction;

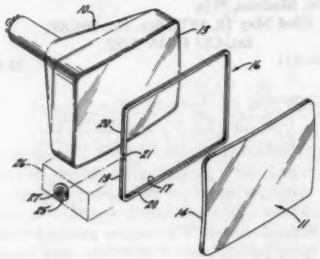
means for sequentially imaging successive scan line length segments of a subject onto said array at a predetermined framing rate as said subject moves in a cross scan direction relative to said array, whereby said detectors sequentially generate data samples representing respective pixels of successive scan lines; and

means coupled to said array for reading said data samples out of said detectors at said framing rate.

4,204,231
CATHODE RAY TUBE WITH LAMINATED PANEL AND METHOD OF MAKING SAME

Marvin M. Permenter, Rockford, Ill., assignor to Clinton Electronics Corporation, Rockford, Ill.

Filed Mar. 20, 1978, Ser. No. 890,612
Int. Cl.² H04N 5/65
U.S. Cl. 358—247 **5 Claims**



1. A method for securing a front panel to the front display face of a cathode ray tube, said method comprising the steps of, fastening the rear side of said panel to said display face with a strip of tape having pressure-sensitive adhesive on its front and rear sides, said tape extending around the margins of the rear side of said panel and being sandwiched between the rear side of said panel and said display face, said tape spacing said panel forwardly from said display face and defining a cell between

said panel and said display face, introducing a flowable bonding agent into said cell, and allowing said bonding agent to cure.

4,204,232

PATTERN TRANSMISSION SYSTEM COMPRISING AN ENCODER FOR ENCODING PARTIAL THINNED PATTERNS IN TWO SCANNING LINES ALONG ONLY ONE BOUNDARY LINE

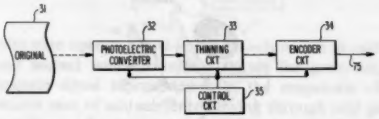
Shoji Mizuno, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1978, Ser. No. 922,701

Claims priority, application Japan, Jul. 8, 1977, 52-82246; Jul. 8, 1977, 52-82247; Jul. 21, 1977, 52-88194; Dec. 20, 1977, 52-153919

Int. Cl.[2] H04N *1/40*

U.S. Cl. 358—260 11 Claims



1. A system for transmitting an original pattern printed with an original pattern stroke width on a surface of a pattern carrying medium and with a first area left on said surface as a background of said original pattern, said original pattern and said first area being substantially of a first and a second tone, respectively, said system comprising:

sampling means supplied with said pattern carrying medium for sampling picture elements from said original pattern and said first area substantially along rectilinear and parallel scanning lines covering said surface in succession, each of said picture elements having four substantally equal sides and four vertices, the picture elements in the successive scanning lines being arranged substantially along straight lines that tharsversely cross said scanning lines, each of said scanning lines having a leading and a trailing end, said original pattern stroke width being generally of at least two picture elements, said sampling means thereby producing electrical signals successively representative of said picture elements and having a first and a second level when the picture elements are of said first and said second tones, respectively;

thinning means responsive to said electrical signals for thinning said original pattern into an eventually thinned pattern, with said first area accordingly widened into a second area serving in effect as a background of said thinned pattern, in accordance with a predetermined law as regards positional relations between each of the first-tone picture elements and the neighboring picture elements, said thinned pattern having a thinned pattern stroke width of a substantially single picture element and being composed of partial patterns, each consisting of at least one picture element of said first tone and having a leading and trailing side in one of said scanning lines, said leading and said trailing sides being nearer to the leading and the trailing ends of said one scanning line, respectively, said thinning means thereby producing a pre-processed signal representative of said thinned pattern and said second area;

classifying means responsive to said pre-processed signal for successively classifying spatial relationships between a first of said partial patterns in a first of said scanning lines and a second partial pattern adjacent to said first partial pattern in a second scanning line next preceding in the succession said first scanning line into a first state in which said first partial pattern is connected with the leading side of said second partial pattern, a second state in which said first partial pattern is connected with the trailing side of said second partial pattern, a third state in which said first and said second partial patterns have aligned leading and trailing sides, and a fourth state in which said first and said second partial patterns have other spatial relationships, said classifying means thereby producing a discrimination signal specifying the successively classified states; and

encoding means responsive to said pre-processed and said discrimination signals for encoding said first partial pattern with reference to the classified state, said encoding means thereby producing a band-compressed signal representative of said original pattern.

4,204,233

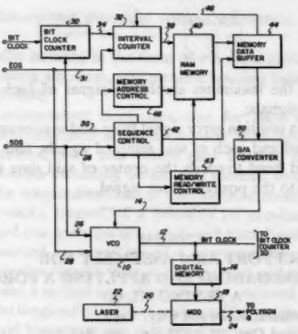
ELECTRONIC FACET ERROR CORRECTION FOR LASER SCANNING

Gary E. Swager, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1977, Ser. No. 847,372

Int. Cl.[2] H04N *1/04*

U.S. Cl. 358—293 6 Claims



1. In a raster output scanner having source means for supplying a light beam which is intensity modulated in accordance with an information bearing electrical bit stream, a photosensitive recording medium, and a rotatably driven multifaceted beam scanning mechanism optically interposed between said source means and said recording medium for cyclically scanning said light beam across said recording medium to reproduce said information on said recording medium; the improvement comprising the combination of

means for generating separate velocity error signals for said facets, each of said error signals representing any difference between the velocity at which said beam is scanned across said recording medium by a respective one of said facets and a predetermined reference velocity; and

means for adjusting the bit rate of said bit stream on a facet-by-facet basis in response to said errors signals to provide a predetermined number of bits per scanning cycle despite any facet-to-facet scan velocity variations.

4,204,234

SYSTEM FOR POSITIONING SINGLE GAP MAGNETIC HEAD TO FOLLOW MOVING RECORDED DATA TRACK

David L. Noble, Monte Sereno, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,729

Int. Cl.[2] G11B *21/10*

U.S. Cl. 360—77 7 Claims

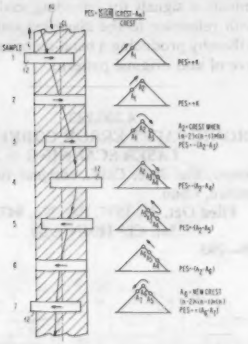
1. A method for positioning a magnetic head to center on a recorded data track comprising the steps of:

serially sampling at uniformly spaced intervals under control of a clock with said head at least three recorded data signals relating to sequential positions along the length of said data track, said head having a single transducing gap

of a width substantially the same as the width of said data track;

converting said sampled signals to digital values;

storing said sampled signals in the memory of a computing unit;



computing the maximum amplitude signal of each of said sampled signals;

computing a position error signal from said maximum amplitude signal and each of said sampled signals; and

moving said head towards the center of said data track in response to the position error signal.

4,204,235

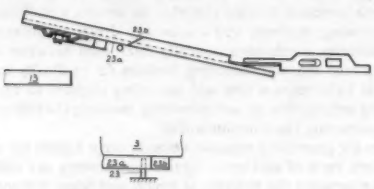
SUPPORT ARM ASSEMBLY FOR LOADING/UNLOADING AND APPLYING A FORCE ON A FLYING HEAD

Herbert R. Stollorz, Redwood City, Calif.

Filed Oct. 18, 1977, Ser. No. 843,272

Int. Cl.[2] G11B *5/60, 5/48, 17/32*

U.S. Cl. 360—103 **3 Claims**



1. In a transducer support assemblyhaving a connector for mounting said assembly to an actuator of a disk storage drive, and transducer means for reading or writing on a storage disk of said disk storage drive, including at least one transducer head with at least two air-bearing skis, an improved head arm loading arrangement, comprising:

a support arm;

first flexing means interconnecting said support arm and said connector;

second flexing means interconnecting said support arm and said transducer means;

said first flexing means providing movement of said arm relative to said connector in a first plane substantially perpendicular to said storage disk; said second flexing means providing movement of said transducer means relative to said arm in a second plane substantially perpendicular to said storage disk;

means for tilting said arm between a first, operative position and a second, inoperative position;

first restraining means defining said first operative position and limiting further movement of said arm towards said storage disk;

second restraining means providing for limited movement of said transducer means in said second plane for flying in operative proximity to said storage disk when said support arm is in said operative position.

4,204,236

SPEAKER DEVICE HAVING A HOLDING MEANS FOR A SUPERMINIATURE TAPE RECORDER

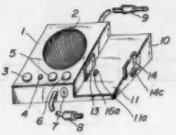
Kazuo Nakasho, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

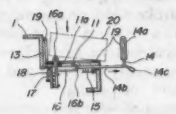
Filed Apr. 24, 1978, Ser. No. 898,809

Claims priority, application Japan, Apr. 5, 1977, 52-52390

Int. Cl.[2] G11B *31/00*

U.S. Cl. 360—137 **4 Claims**





1. A speaker device adapted to have a superminiature tape recorder mounted in operative engagement therewith comprising an external speaker and holding means formed together in an integral unit, said holding means operating to hold a tape recorder placed thereon in operative relationship with said speaker device; said holding means comprising a base for placing the tape recorder thereon, a fixed plate provided on one side of said base, and a movable keep plate provided on the other side of said base for keeping the tape recorder in position; with a holding mechanism being provided, said holding mechanism comprising an engaged member extending into the base from said movable keep plate, a spring provided between the engaged member and the base, and a set lever for engaging with the movable keep plate and including a projection member projecting slightly from a hole bored in the base, with a second spring being mounted between a base plate and the lever.

4,204,237

SOLID STATE TRANSFORMER DIFFERENTIAL RELAY

Stanley E. Zocholl, Holland, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Nov. 30, 1978, Ser. No. 965,141

Int. Cl.[2] H02H *3/28, 7/04*

U.S. Cl. 361—36 **16 Claims**

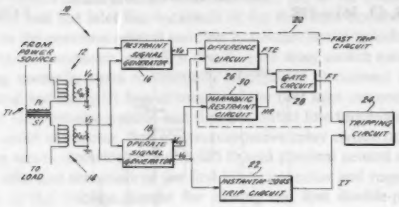
1. A transformer differential relay for monitoring the magnitude of the currents in first and second windings of a power transformer and for disconnecting said power transformer from a power source supplying said power transformer when the relative magnitude of said currents indicate the presence of an internal fault in said power transformer, said relay comprising:

first current transformer means for generating a first voltage signal representative of the magnitude of said current flowing through said power transformer first winding;

second current transformer means for generating a second voltage signal representative of the magnitude of said

current flowing through said power transformer second winding;

a solid state restraint signal generator responsive to said first and second winding voltage signals for generating a restraint signal representative of the magnitude of the larger of said first and second currents at each measurement instant;



a solid state operate signal generator responsive to said first and second winding voltage signals for generating an operate signal representative of the magnitude of the vector sum of said currents flowing through said power transformer first and second windings; and

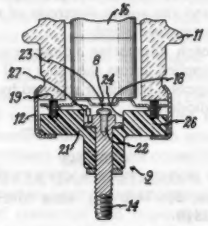
means for disconnecting said power transformer from said power source when the magnitude of said operate signal rises above a predetermined percentage of said restraint signal.

4,204,238

SURGE VOLTAGE LIGHTNING ARRESTERS

Earl W. Stetson, Pittsfield, Mass., assignor to General Electric Company

Filed Feb. 6, 1978, Ser. No. 875,221
Int. Cl.² H02H 3/22
U.S. Cl. 361—125 **3 Claims**



1. An improved ground disconnector for a surge arrester of the type having a metal sealing disc and an explosive cartridge, the improvement which comprises:

an embossed aluminum sealing disc having a raised portion for electrically connecting with the surge arrester and a flat portion in arc relationship with the explosive cartridge; and

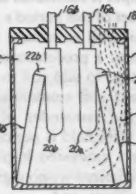
a refractory metal coating having a thickness of from 0.005" to 0.030" deposited on a portion of the explosive cartridge to provide a thermal delay to the explosive.

4,204,239

ABNORMAL VOLTAGE PROTECTION DEVICE

Mitsumasa Imataki; Mikio Mochizuki, and Yoshikazu Shibuya, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1978, Ser. No. 908,234
Claims priority, application Japan, May 21, 1977, 52-58989
Int. Cl.² H02H 9/04
U.S. Cl. 361—127 **2 Claims**



1. A three-phase abnormal voltage protection device comprising:

a metallic housing in the form of a hollow circular cylinder including a bottom, said metallic housing being connected to ground;

three independent electrodes, one for each of the three phases, disposed at equal angular intervals in a circle concentric with and within said metallic housing, said electrodes extending within said metallic housing parallel to the longitudinal axis of said metallic housing;

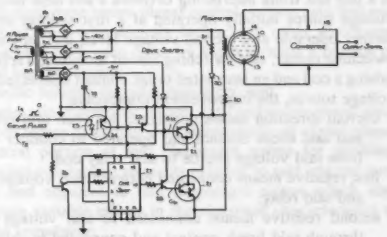
three stacks formed of a plurality of non-linear resistors placed one upon another, each said stack having a first end connected to a portion of a corresponding one of said electrodes remote from said bottom of said metallic housing and a second end, tilted radially outward with respect to the longitudinal axis of said metallic housing, connected to said bottom of said metallic housing.

4,204,240

HIGH-VOLTAGE IMPULSE DRIVER FOR ELECTROMAGNETIC FLOWMETER

Roy F. Schmoock, Richboro, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Oct. 26, 1978, Ser. No. 954,749
Int. Cl.² G01F 1/58
U.S. Cl. 361—152 **8 Claims**



1. In an electromagnetic flowmeter provided with a flow tube having a pair of electrodes mounted at diametrically-opposed positions therein, and an electromagnet having an excitation coil to produce a transverse magnetic field within said tube, the voltage induced in the liquid passing through said tube and intersecting said field being transferred to said electrodes to provide a flow-induced signal, an energy-efficient drive system to excite said electromagnet, said system comprising:

A a full-wave rectifier means connectable to an a-c line

supplying power having a predetermined frequency and producing a rectified voltage;

B switching means responsive to gating pulses to connect the output of said rectifier means to said coil;

C means to apply gating pulses having a predetermined period to said switching means at a rate which is low relative to said power frequency;

D means operable during each gating period when said rectifier means output is connected to said coil to apply to said coil at the outset of this period a surge of high voltage to shock-excite said coil to cause a magnet current flow therein which attains a predetermined level and to continue to apply voltage to said coil to maintain the magnet current flow in said coil substantially at said predetermined level for the remainder of the gating period, whereby a steady state field is periodically established in said flow tube, and unwanted in-phase and quadrature components are minimized without giving rise to polarization and galvanic effects; and

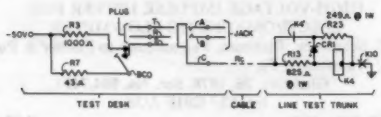
E means to sense the level of magnet current flowing through said coil to produce a control signal, and means responsive to said control signal to intermittently apply surges of voltage to said coil to maintain said magnet current at said level.

4,204,241

LOW POWER CONSUMPTION RELAY SWITCHING CIRCUIT FOR USE IN CONJUNCTION WITH A LINE TEST TRUNK INTERFACING TO A TEST DESK

Huan-Tong Yang, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 26, 1978, Ser. No. 972,747
Int. Cl.² H04M 3/22
U.S. Cl. 361—154 **4 Claims**



1. A low power consumption relay switching circuit for use in a line test trunk interfacing between a test desk including a voltage source initially operated at a first voltage level and further operable at a second voltage level, and an electronic switching center, said switching circuit including a relay comprising a coil and an associated break contact connected to said voltage source, the improvement comprising:

current direction means connected between said relay coil and said break contact and operated to conduct voltage from said voltage source to said relay coil;

first resistive means connected between said voltage source and said relay;

second resistive means connected to said voltage source through said break contact and connected in shunt with said relay coil, operated to inhibit operation of said relay by limiting current flow through said relay coil;

said relay operated in response to said second voltage level of said voltage source to disconnect said second resistive means from said voltage source;

said first resistive means operated in response to said relay operation to limit current flow through said relay coil; and

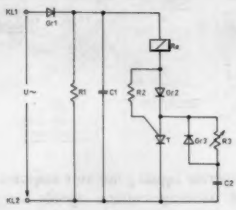
said current direction means further operated in response to said relay operation to block current flow from said voltage source to said second resistive means.

4,204,242

TIME DELAY CIRCUIT FOR TIMING RELAYS

Gerd L. Metzner, Berlin, Fed. Rep. of Germany, assignor to Schleicher GmbH & Co. Relais-Werke KG, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,663
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2727073
Int. Cl.² H01H 7/14
U.S. Cl. 361—198 **3 Claims**



1. In a time delay circuit for timing relays operated with alternating current, the circuit having first and second input terminals adapted to receive an alternating voltage, a rectifier for rectifying said alternating voltage to provide a direct voltage, a programmable unijunction transistor having anode, cathode and gate electrodes, a relay coil, the rectifier, relay coil and the anode and cathode electrodes of the programmable unijunction transistor connected in series across the first and second input terminals, and RC series network connected across the anode and cathode electrodes of the programmable unijunction transistor, wherein the direct voltage is applied to the anode electrode of the programmable unijunction transistor with limited filtering and used as a reference voltage, which is integrated by means of the RC series network and stored and compared with the reference voltage,

the relay coil being energized as a result of the integrated output of the RC series network exceeding the reference voltage at the gate electrode of the programmable unijunction transistor, the improvement wherein the entire operating voltage is used as the reference voltage, and

the direct voltage having limited filtering and therefore a relatively high amplitude is supplied to the relay coil; and

a programming resistor connected between the relay coil and the gate electrode of the programmable unijunction transistor;

a diode connected in the forward direction between the relay coil and the anode electrode of the programmable unijunction transistor; and

wherein, in each alternating voltage cycle, the reference voltage is applied across the relay coil and the programmable unijunction transistor reduced by the forward voltage of the diode.

4,204,243

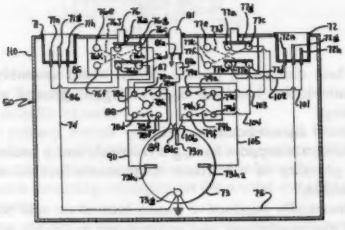
POLARITY INDICATING AND REVERSING UNIT

Anthony J. Ross, 526-74th St., Anna Marie Island, Holmes Beach, Fla. 33510

Filed Mar. 2, 1978, Ser. No. 882,607
Int. Cl.² H01R 3/06; G01R 31/02
U.S. Cl. 361—245 **6 Claims**

6. A polarity indicating and reversing unit comprising, first and second inlet connectors each adapted for connection to respective first and second power supply lines of the type having two-line wires plus ground, each inlet connector having an inlet ground terminal and nominal neutral and hot inlet line terminals, an outlet connector adapted for connection to a load supply line of the type having three-line wires plus ground, said outlet connector having an outlet ground terminal and first and second hot outlet line terminals and a common

neutral outlet line terminal, ground conductor means electrically interconnecting the inlet ground terminals on the first and second inlet connectors to each other and to the outlet ground terminal on the outlet connector, a first double-pole polarity reversing switch means and a first double-pole relay switch means, means electrically connecting said first double-pole polarity reversing switch means and said first double-pole relay switch means in series with each other and to the nominal neutral and hot inlet line terminals of the first inlet connector and to the common neutral and first hot outlet line terminals of the outlet connector, said first double-pole relay switch means being normally open to normally electrically disconnect the neutral and hot inlet line terminals of the first inlet connector from the common neutral and first hot outlet line terminals of the outlet connector, first electroresponsive relay switch operating means electrically connected to said nominal neutral and hot inlet line terminals of the first inlet connector and responsive to the voltage thereat for closing the first double-pole relay switch means, said first double-pole polarity reversing switch means being operable from a first position electrically connecting the nominal neutral and hot inlet line terminals of the first inlet connector to the common neutral and first hot outlet line terminals respectively of the outlet connector to a second position electrically connecting the hot and neutral inlet line terminals of the first inlet connector to the common neutral and first hot outlet line terminals respectively of the



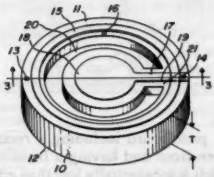
outlet connector, a second double-pole polarity reversing switch means and a second double-pole relay switch means, means electrically connecting the second double-pole polarity reversing switch means and the second double-pole relay switch means in series with each other and to the nominal neutral and hot inlet line terminals of the second inlet connector and to the common neutral and second hot outlet line terminals of the outlet connector, said second double-pole relay switch means being normally open to electrically disconnect the nominal neutral and hot inlet line terminals of the second inlet connector from the common neutral and second hot outlet line terminals of the outlet connector, second electroresponsive relay switch operating means electrically connected to said nominal neutral and hot inlet line terminals of said second inlet connector and responsive to the voltage thereat for closing the second double-pole relay switch means, said second polarity reversing switch means being operable from a first position electrically connecting the nominal neutral and hot inlet line terminals of the second inlet connector to the common neutral and second hot outlet line terminals respectively of the outlet connector to a second position electrically connecting the hot and neutral inlet line terminals of the second inlet connector to the common neutral and second hot outlet line terminals respectively of the outlet connector, and polarity indicator means for indicating when the voltage applied to the common neutral outlet line terminal of the outlet connector is above ground potential.

4,204,244

ELECTROMECHANICAL PRESSURE TRANSDUCER

Roland K. Ho, McHenry, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 23, 1978, Ser. No. 871,273
Int. Cl.² H01G 7/00
U.S. Cl. 361—283 **3 Claims**



1. A pressure transducer in which pressure changes displace a diaphragm whose position determines electrical characteristics of said transducer, comprising:

base substrate means having top and bottom substantially planar end surfaces, said top end surface having a substantially planar central portion;

flexible diaphragm means, relatively thin with respect to the distance between said top and bottom end surfaces, having a planar central portion and a peripheral portion;

mounting means for mounting said peripheral portion of said diaphragm means to said base substrate top surface, said mounting means, said diaphragm planar central portion and said substrate top surface planar portion generally forming an internal cavity, said diaphragm central portion being displaceable with respect to said top surface in response to pressure changes, and wherein said cavity maintains a fixed reference pressure and pressures applied exterior to said internal cavity cause said diaphragm means to flex and thereby alter electrical characteristics of said transducer in response to pressure changes;

said pressure transducer being a capacitive transducer having a first electrode on said top surface central planar portion of said base substrate and a second electrode on said diaphragm means planar central portion, said first and second electrodes directly facing each other across and separated from each other by a gap forming a portion of said internal cavity;

a metallic housing for said transducer; and

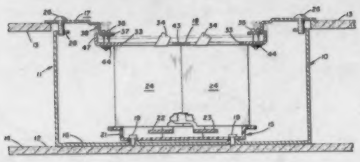
wherein said diaphragm means has conductive guard electrode means extending over substantially all of said planar central portion of said diaphragm means for shielding against conductive elements exterior to said internal cavity and adjacent to said diaphragm means which may create variable effects in the electrical characteristics of said transducer;

said transducer including connecting means comprising a flexible conductive gasket located on a surface of said diaphragm means parallel to said planar central portion of said diaphragm means that forms a boundary for said internal cavity, and wherein said guard electrode means comprises a conductive metallization area substantially larger than said first electrode area and deposited on the surface of said diaphragm means in contact with said flexible conductive gasket, said conductive gasket electrically connecting said metallic housing and said guard electrode means.

4,204,245
FRONT TRIM FOR PANELBOARD

Roger D. Luke, Norcross, and John M. Rhodes, Atlanta, both of Ga., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 26, 1978, Ser. No. 945,890
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—358 8 Claims

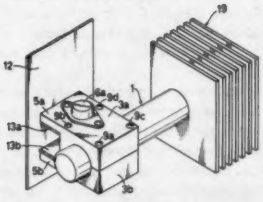


1. An electrical panelboard including a rectangular enclosure having an open front and having a front to back dimension, or depth, which is substantially less than either the length or width of said enclosure; interior means having circuit protection energizing elements; said interior means mounted within said enclosure; closure means at the front of said enclosure; said closure means including a front plate having an interior opening smaller than the open front of the enclosure and in general alignment with said open front; said closure means also including a face plate having opening means for handles of circuit breakers, mounted to said panelboard and connected with said energizing elements, to extend through; and first means accessible for operation at the front of said front plate for front to rear adjustment of said face plate while said enclosure, said interior means and said front plate remain in fixed positions; said front plate being provided with rearward extending first lip means surrounding said interior opening and said face plate being provided with forwardly extending second lip means outboard of said opening means and disposed in telescoping relationship with said first lip means; said first lip means being inboard of the second lip means; said front plate also being provided with a narrow marginal portion extending inward from the rear edge of the first lip means; said first means being secured to said marginal portion.

4,204,246
COOLING ASSEMBLY FOR COOLING ELECTRICAL PARTS WHEREIN A HEAT PIPE IS ATTACHED TO A HEAT CONDUCTING PORTION OF A HEAT CONDUCTIVE BLOCK

Hiroshi Arii, Kawasaki; Hirohito Kawada, Mitaka; Takashi Yoshida, and Chiaki Nonaka, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 766,379, Feb. 7, 1977, Pat. No. 4,120,019.
This application May 8, 1978, Ser. No. 903,397
Claims priority, application Japan, Feb. 14, 1976, 51-16469[U]
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—385 1 Claim

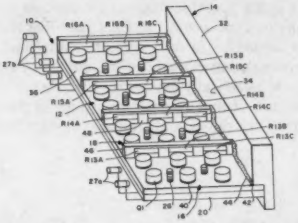


1. In a cooling assembly including a heat generating electric part having leads, a heat conductive block mounting said heat generating electric part, and a heat pipe attached to said heat conductive block for radiating the heat from said heat generating electric part to the air through said heat conductive block, the improvement in which said heatconductive block comprises a thickened portion attached to said heat pipe, and a thinned portion formed contiguously to said thickened portion, said heat generating electric part is mounted on said heat-conductive block so that at least one part of said heat generating electric part extends on the outer surface of said thinned portion, and a connector is secured to the inner surface of said thinned portion and is connected to said leads of the heat generating electric part.

4,204,247
HEAT DISSIPATING CIRCUIT BOARD ASSEMBLY

Patrick A. Wigley, Sunnyvale, Calif., assignor to CPS, Inc., Sunnyvale, Calif.

Filed Sep. 22, 1978, Ser. No. 945,094
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—387 9 Claims



1. A heat dissipating printed circuit board assembly especially suitable for handling high voltage-to-ground circuits, comprising:

(a) a printed circuit board including

(i) a substrate support having a frontside and a backside,

(ii) a plurality of electronic components located on said frontside,

(iii) electrically conductive means located on said backside and interconnecting said components in circuit with one another in a predetermined way, and

(iv) terminal input and output means electrically connected in circuit with said electrical components;

(b) a heat conductive and electrically conductive heat dissipating block extending along one edge of said support and having a surface projecting up from and normal to the frontside of said support, said block being spaced predetermined distances from said components, said block being adapted for connection to an electrically grounded, thermally conductive frame for dissipating heat thereto;

(c) heat conductive and electrically non-conductive heat transfer means connected to said electronic components and said block for transferring heat from said components to said heat dissipating block for dissipation thereby, said heat transfer means including

(i) a heat conductive and electrically non-conductive substrate located over and in confronting relationship with the frontside of said support,

(ii) heat conductive and electrically non-conductive means thermally connecting said substrate with said electronic components, and

(iii) heat conductive and electrically non-conductive means thermally connecting said substrate with said block;

(d) at least one resistance arrangement including

(i) a network of interconnected resistors,

(ii) means for electrically interconnecting said resistors in circuit with said electronic components, and

(iii) a heat conductive and electrically non-conductive substrate supporting said resistors and extending entirely within a plane transverse to said heat transferring substrate and block, said resistor supporting substrate being in

physical contact with said resistors and said block for transferring heat from said resistors to said block for dissipation thereby; and

(e) electrically non-conductive means for encapsulating

(i) said printed circuit board including its support, electronic components and component interconnect means, while allowing said terminal input and output means to extend through said encapsulating means,

(ii) said heat transferring substrate, and

(iii) said resistance arrangement including its resistors, resistor supporting substrate and interconnect means.

4,204,248

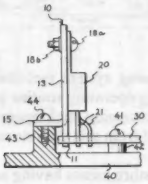
HEAT TRANSFER MOUNTING ARRANGEMENT FOR A SOLID STATE DEVICE CONNECTED TO A CIRCUIT BOARD

Daniel S. Proffit, Lynchburg, and Maurice Regignano, Madison Heights, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Nov. 20, 1978, Ser. No. 962,094

Int. Cl.[2] H05K 7/20

U.S. Cl. 361—388 **5 Claims**



1. An improved radio construction comprising:

a. a metallic chassis;

b. a printed circuit board mounted on said chassis, said printed circuit board having holes therethrough in which electrical leads can be placed and soldered;

c. and a mounting arrangement for a solid state device comprising:

1. a metallic plate extending away from said printed circuit board and having at least two spaced projections, said spaced projections extending into respective holes in said printed circuit board, and being soldered thereto;

2. a metallic member attached to said plate in the vicinity of said spaced projections, said metallic member extending from said plate over and in contact with a portion of said chassis;

3. means fastening said metallic member to said chassis to provide a heat path from said metallic plate through said metallic member to said chassis;

4. and a solid state device attached to said metallic plate in heat transfer relation therewith, said solid state device having leads extending into respective holes in said printed circuit board and being soldered thereto.

4,204,249

DATA PROCESSING SYSTEM POWER CONTROL

Malcolm Dye, Southampton, and Richard C. J. Hyde, Chandlers Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

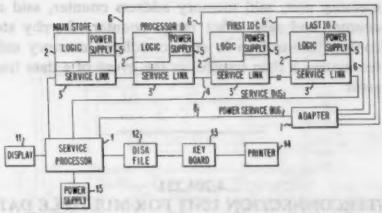
Filed Jun. 27, 1977, Ser. No. 810,560

Claims priority, application United Kingdom, Jun. 30, 1976, 27318/76

Int. Cl.[2] G06F 11/00

U.S. Cl. 364—200 **10 Claims**

1. Data processing apparatus including a service subsystem and a plurality of other subsystems having service link communication with said service subsystem and including at least one processing sybsystem, a plurality of power supply units to provide electrical power to respective ones of said other subsystems, and power supply means dedicated to provide electrical power to enable the service subsystem to start up, the service subsystem including an adapter and a microprogram controlled processor having address and data bus means connected to said adapter, said power control adapter unit being connected between said processor and said power supply units and including measuring and logic curcuits operable under the



control of said processor to provide data collection from and data distribution to said plurality of power supply units, said service subsystem also including a power control microprogram storage arranged in operation of the service subsystem to control and monitor said plurality of power supply units by operation of said processor and said adapter.

4,204,250

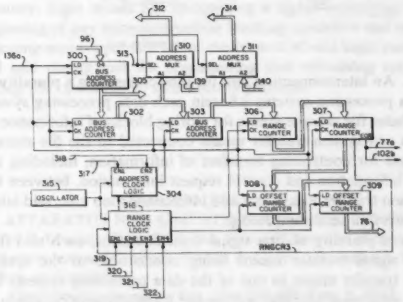
RANGE COUNT AND MAIN MEMORY ADDRESS ACCOUNTING SYSTEM

Edward F. Getson, Jr., Lynn, Mass.; John H. Kelley, Nashua; Albert T. McLaughlin, both of Hudson, N.J., and Donald J. Rathbun, Andover, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Aug. 4, 1977, Ser. No. 821,900

Int. Cl.[2] G06F 13/00

U.S. Cl. 364—200 **4 Claims**



1. A data transfer control system in a peripheral control unit having a scratchpad memory unit and a hardware control means, said control system having architecture accommodating both the loading of memory address, range and offset range parameters in a serial stream, and the dynamic amending of said parameters during a data transfer between a disk device and a main memory unit of a data processing system wherein said peripheral control unit and said main memory unit are electrically coupled by an asynchronous communication bus, which comprises:

a. a memory address counter responsive to said hardware control means for dynamically updating memory address information to said bus during a data transfer;

b. a range counter electrically connected to said memory address counter to form a serial data path and responsive to said hardware control means for indicating the completion of a data transfer to said hardware control means;

c. an offset range counter electrically connected to said range counter in extension of said serial data path and responsive to said hardware control means for dynamically indicating to said hardware control means the occurrence of a first data byte in an information stream to be transferred; and

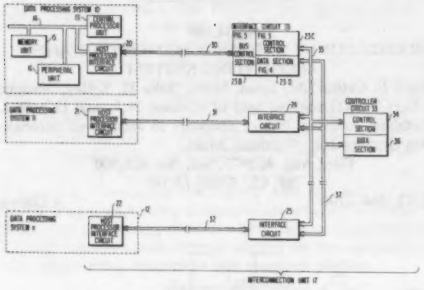
d. firmware control means responsive to said hardware control means between data transfers for circulating a serial stream of said parameters through said scratchpad memory unit, said memory address counter, said range counter and said offset range counter, thereby storing control information in said scratchpad memory unit for reinitiating a data transfer in the event of a data transfer error.

4,204,251

INTERCONNECTION UNIT FOR MULTIPLE DATA PROCESSING SYSTEMS

Finn Brudevold, 35 Fairbanks Ave., Wellesley, Mass. 02181

Filed Dec. 28, 1977, Ser. No. 865,116
Int. Cl.[2] G06F *15/16*
U.S. Cl. 364—200 **20 Claims**



1. An interconnection unit for interconnecting a plurality of data processing systems wherein each data processing system includes file storage means for storing blocks of information as files and system transfer means connected to the file storage means for controlling transfers of information, including the file information and control request information, between the system transfer means and said interconnection unit, said interconnection unit comprising:

A. a plurality of first signal transfer means, each said first signal transfer means being connectible to the system transfer means in one of the data processing systems for receiving informaton from and transferring information to the system transfer means in the one data processing system,

B. request selection means connected to the plurality of said first signal transfer means for transferring exclusive control of said interconnection unit to one of the data processing systems in response to the coincidence of the receipt of request control information in said first transfer means from the data processing system connected thereto and the identification of the data processing system in accordance with a selection sequence;

C. means for storing information received from the data processing systems, and

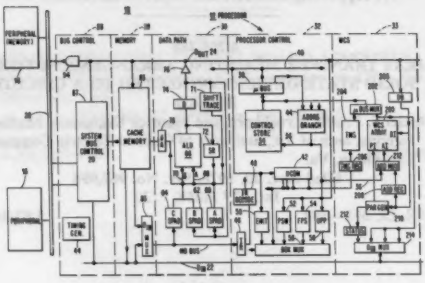
D. second signal transfer means connected to all said first signal transfer means and said information storage means for transferring information between the selected one of the data processing systems and said storage means through said first signal transfer means.

4,204,252

WRITEABLE CONTROL STORE FOR USE IN A DATA PROCESSING SYSTEM

George E. Hitz, Sudbury; Charles H. Kaman, Newton Highlands; Craig Mudge, Weston; James F. O'Loughlin, Westford, and Daniel T. Sullivan, Bolton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 3, 1978, Ser. No. 883,085
Int. Cl.[2] G06F *9/18, 13/00*
U.S. Cl. 364—200 **15 Claims**



1. In a data processing system including at least one data storage unit for storing operating routine instructions and data and a processor for processing such operating routine instructions and data received from said data storage unit, said processor comprising:

A. primary control store means having an output, an address input and a data input and having a plurality of addressable storage locations for storing processor instructions, pluralities of said processor instructions being grouped together to form programs utilized to control the processor during the execution of said operating routine instructions received by the processor from the data storage unit;

B. first addressing means coupled to the address input of said primary control store means for addressing certain ones of said addressable storage locations and causing the processor instructions contained in said addressed storage locations to be coupled to the output of said primary control store means;

C. instruction transmission means coupled to the output of said primary control store means for transmitting processor instructions at the output of said primary control store means throughout said processor for controlling the operation thereof;

D. secondary control store means having an output coupled to said instruction transmission means and an address input and having a plurality of addressable storage locations therein for storing processor instructions, pluralities of said processor instructions being grouped together to form programs utilized to control the operation of said processor;

E. second addressing means coupled to the address input of said secondary control store means for addressing certain ones of the addressable storage locations in said secondary control store means and causing contents of said addressed storage locations to be coupled to the output of said secondary control store means;

F. data means responsive to the output of said secondary control store means having an input for receiving data from said processor and an output coupled to the data input of said primary control store means for transferring data to said primary control store means;

G. third addressing means responsive to the output of said secondary control store means and coupled to said first addressing means, for controlling the addressing of said primary control store means in response to the output of said secondary control store means; and

H. enabling means, having an output coupled to said second addressing means and responsive to an output from said primary control store means for enabling said second addressing means to address certain ones of said addressable storage locations in said secondary control store means; whereby processor instructions stored in said secondary control store means may be used to control the processor when data is transferred to and from said primary control store means.

4,204,253

DEVICE FOR GENERATING AND CORRECTING A USER PROGRAM

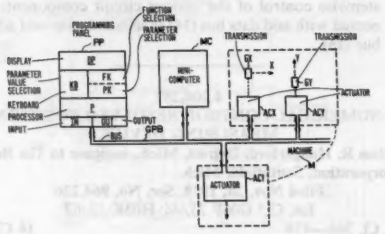
Joannes G. van den Hanenberg, and Frederikus J. de Munnik, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,506

Claims priority, application Netherlands, Mar. 22, 1977, 77 03078

Int. Cl.[2] G06F *15/16, 9/19*

U.S. Cl. 364—200 **5 Claims**



1. A programming panel device for generating and correcting user programs, said device connected to a computer having a memory for controlling a machine control system, said device comprising:

a processor;

said processor storage means including means to store at least one function step in a user program;

keyboard means for data entry into said processor;

input/output means for said processor;

display means under the control of said processor for displaying function steps of said user programs;

bus means for connection of said input/output means to said computer and said machine control system; function selection means under the control of said processor for the selection of a function to be programmed comprising:

means to transfer a table of function codes and associated parameter codes for at least one function step of a user program from said computer over said bus means to said storage means of said processor;

said display means including means for displaying said function and parameter codes;

said transferred and displayed parameter codes being dependent upon the function selected by said function selection means;

parameter value input means under the control of said processor for inputting specific values for said parameters to be inserted into functions which have been selected, the inputting of a parameter value for all of the parameters in the function selected resulting in the completion of the programming of a selected function;

means to transfer said completed function to said processor storage means to be stored as a user program step;

means to transfer each of said completed user program steps to said memory of said computer over said bus means for storage in said computer and for subsequent execution by said computer for controlling said machine control system.

4,204,254

ELECTRONIC COMPUTER INCLUDING AN INFORMATION REFRESHING ARRANGEMENT

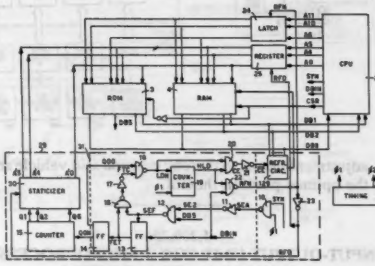
Aldo Muzzani, and Ilio Paccapelo, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A.

Filed May 19, 1978, Ser. No. 907,490

Claims priority, application Italy, May 25, 1977, 68191 A/77

Int. Cl.[2] G06F *13/02, 9/16*

U.S. Cl. 364—200 **4 Claims**



1. In an electronic computer having a dynamic operative memory formed of capacitive elements selectively recorded with an electric charge, a read only memory storing microprograms each one formed of a sequence of microinstructions, a central processing unit cooperating with said operative memory, a timing unit for timing the operations of said processing unit for fetching said microinstructions one at a time from said read only memory, and decoding means also included in said processing unit for decoding the microinstructions so fetched to be executed by said processing unit, an information refreshing arrangement for said operative memory comprising: refreshing means conditionable for periodically refreshing the information stored in the capacitive elements of said operative memory, logic means for recognizing a signal indicating the beginning of any microinstruction fetching operation and conditioning means operable under the control of said logic means and said timing unit for conditioning said refreshing means during the operation of said decoding means.

4,204,255

APPARATUS FOR ADJUSTING A VEHICLE SEAT

Heinz P. Cremer, Remscheid, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co KG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 831,865, Sep. 9, 1977, abandoned. This application Sep. 27, 1978, Ser. No. 946,394

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640528

Int. Cl.[2] B60N *1/02*; G06F *15/20*

U.S. Cl. 364—425 **6 Claims**

3. Apparatus for adjusting the optimal position of a vehicle seat for a person under varying driving conditions comprising:

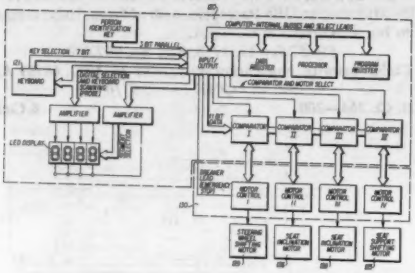
a vehicle seat;

means for adjusting at least one position of said vehicle seat;

computer means having a memory for vehicle-specific entry parameters and being useful for determining the optimal position of said vehicle seat;

entry means associated with said computer means for entering into said computer personal input data for said person and input data for said driving conditions, said computer means being operable to determine said optimal seat position in response to said input data and to generate output signals corresponding to said optimal seat position; and

control means associated with said computer means and responsive to said output signals for controlling said seat



adjustment means to thereby position said vehicle seat into the optimal position thereof.

4,204,256

INPUT-OUTPUT UNIT FOR A MICROPROCESSOR ENGINE CONTROL SYSTEM

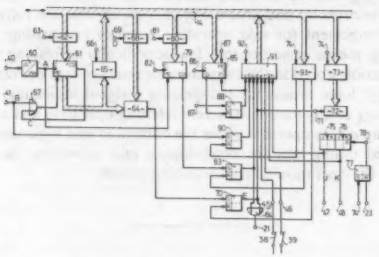
Winfried Klötzner, Maulbronn-Schmie, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 916,827

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732781

Int. Cl.[2] G06F *15/20;* G05B *15/02;* F02D *5/02*

U.S. Cl. 364—431 **15 Claims**



1. In a system for controlling repetitive operations of a machine dependent on operating parameters such as the operation of electrical ignition in an internal combustion engine, which system comprises a microprocessor, a clock pulse generator, a read-only memory (ROM, PROM), a random access memory (RAM), a data bus and an address bus, both interconnecting said microprocessor with said read-only memory and said random access memory, and read and write enable connections for enabling the reading of said memories and writing into said random access memory the data on said data bus at the memory address specified on the said address bus,

an input-output unit for said system connected to said address bus and read and write connections including a decoding circuit, connected to said data bus, and connected to said microprocessor also through "clear" and "interrupt" connections for receiving a clearing command from said microprocessor and for providing an interrupt to said microprocessor, said input-output unit comprising:

a counter **(61)** for counting shaft rotation rate dependent signals arranged for operation in successive counting invervals, the length of which intervals are determined by setting of said counter through said data bus **(14)**, and the position in time of which intervals is controlled by at least one timing reference mark of said machine, said counter having a multibit count state output and having input connections for having a count value set therein for initiation of counting and termination of and for counting said signals;

a comparator **(64)** and a buffer store **(68)** therefor, said comparator having one multibit comparison input connected to the count-state output of said counter **(61)** and its other multibit comparison input connected to said buffer store **(68)**, and having an output for indicating at least one comparison condition of signals at said inputs thereof, said buffer being arranged to have its content written through said data bus;

a selectable multi-channel final stage array **(75, 76, 49, 50)** and providing a plurality of output command channels,

and select logic circuits **(72, 73)** for sequential preselection of said channels of said final stage array, said select logic circuits being connected to said data bus for their control and to said final stage array for channel preselection in response to a signal of a control signal sequence (F) and including circuits for transferring timed signals (E) obtained in response to the output of said comparator to the channels preselected in sequence,

said decoding circuit **(100)** being constituted so as to provide stepwise control of the various circuit components connected with said data bus **(14)** as selected over said address bus **(15)**.

4,204,257

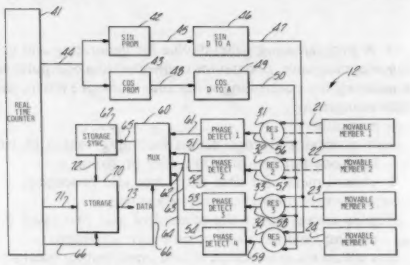
NUMERICAL CONTROL RESOLVER POSITION MEASURING DEVICE

William R. Hungerford, Detroit, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 28, 1978, Ser. No. 964,226

Int. Cl.[2] G06F *15/46;* H03K *13/02*

U.S. Cl. 364—474 **14 Claims**



1. An absolute resolver position measuring device for a numerical control apparatus that controls a machine having at least one movable member wherein a resolver is operatively connected to the movable member such that the rotor of the resolver rotates as the member moves, comprising:

real time counter means for counting real time and for providing a multi-digit digital data word that is cyclically redundant;

memory means addressable by said real time counter means, said memory means for cyclically providing sequences of digital data words which digital data words represent quadrature sinusoidal waveforms;

first digital to analog converter means responsive to digital data words from said memory means for providing an approximately sinusoidal waveform to energize a first stator winding of said resolver;

second digital to analog converter means responsive to digital data words from said memory means for providing an approximately sinusoidal waveform to energize a second stator winding of said resolver, the sinusoidal outputs of said first and second digital to analog converter means being in a quadrature relationship;

phase detecting means responsive to the waveform from the rotor of said resolver for indicating when the waveform provided by said resolver rotor reaches a predetermined phase relationship; and

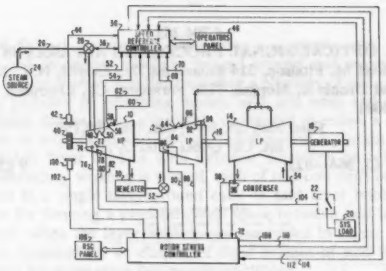
storage means for storing the output of said real time counter means in response to the output indicative of said phase detecting means such that the contents of said storage means represents the position of the rotor and the movable member.

4,204,258

TURBINE ACCELERATION GOVERNING SYSTEM

William E. Zitelli, Monroeville, and Alan T. Heltsley, Chester Upland, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1978, Ser. No. 948,263
Int. Cl.[2] F01B *25/06*; F01K *13/02*
U.S. Cl. 364—494 **9 Claims**



1. In a turbine speed control system which is operative to control the speed of a steam turbine through a turbine start-up operation by regulating the position of at least one steam admission valve of said turbine in accordance with a speed control function based on a computed speed error between an adjustable speed reference signal and a signal representative of the actual speed of said turbine, said speed reference signal being adjusted, at times, to converge to a desired speed demand signal at a selected acceleration, an improvement comprising:

a first controller operative to control the speed of said turbine at selected accelerations from turning gear to a predetermined turbine speed value;

a second controller selectively operative to govern said turbine accelerations as controlled by said first controller in accordance with calculated present and anticipated rotor stresses of said steam turbine, said second controller performing said rotor stress calculations concurrently with the speed control operations of said first controller;

means for generating a plurality of signals representative of actual temperature differences of predetermined portions of said steam turbine and for providing said differential temperature representative signals to said first controller;

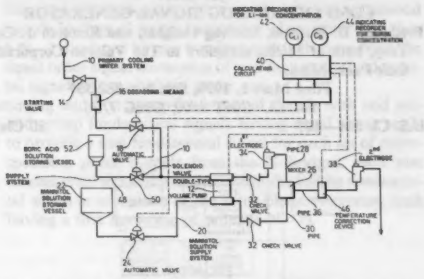
and wherein said first controller is further operative to reduce said turbine acceleration to substantially zero upon the detection of at least one of said representative temperature difference signals exceeding a preset limit value respectively associated therewith, said first controller being still further operative to detect when said turbine speed is controllably held substantially fixed in one of a number of predetermined critical speed zones as a result of said acceleration governing by said second controller or as a result of a temperature difference signal exceeding its preset limit value and to adjust said turbine speed outside of said one critical speed zone during either one of said detected turbine speed states.

4,204,259

AUTOMATIC APPARATUS FOR CONTINUOUS DETERMINATION OF BORON AND LITHIUM CONCENTRATIONS

Ikuo Yabe, Tokyo, Japan, assignor to Nikkiso Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1978, Ser. No. 895,367
Int. Cl.[2] G06F *15/52*; G01N *27/42*
U.S. Cl. 438—497 **6 Claims**



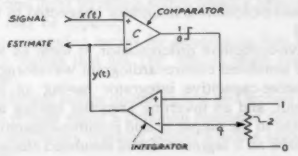
1. An automatic apparatus for continuous determination of boron and lithium-ion concentrations in the primary cooling water used in a pressurized water reactor plant comprising, means for conducting a source of boric acid sample water containing lithium ions to a mixer, means for conducting a mannitol solution to said mixer thereby to form in said mixer a boric acid-mannitol complex sample water, a first electrode contacting said boric acid sample water to measure the conductivity thereof, a second electrode contacting the boric acid-mannitol complex sample water as it leaves the mixer to measure the conductivity thereof, a calculating circuit connected with each of the said electrodes for receiving the conductivity measurements emanating therefrom, said calculating circuit including elements for calculating the boron and lithium-ion concentrations of the sample water by utilization of the conductivity measurements, and at least one indicating recorder connected to said calculating circuit for indicating and recording the boron and lithium-ion concentrations.

4,204,260

RECURSIVE PERCENTILE ESTIMATOR

Paul A. Nysen, Clovelly, Australia, assignor to Unisearch Limited, Australia

Filed Jun. 7, 1978, Ser. No. 913,326
Claims priority, application Australia, Jun. 14, 1977, PD0425
Int. Cl.[2] G06F *15/36*
U.S. Cl. 364—554 **6 Claims**



1. A recursive percentile estimator, comprising

a comparator for comparing a time varying signal quantity and a time varying estimate signal corresponding to a predetermined percentile, said comparator having an output, a first input to which said signal quantity is supplied and a second input to which said estimate signal is supplied;

an integrator having a first input connected to the output of said comparator, a second input and an output connected to the second input of said comparator, said integrator providing said estimate signal at its output; and

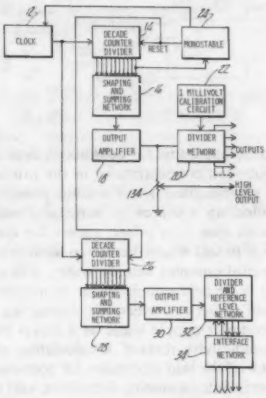
probability means connected to the second input of said integrator for providing a signal corresponding to a cumulative probability equivalent to said predetermined percentile.

4,204,261

COMPLEX ANALOG SIGNAL GENERATOR

Frederick B. Ruszala, Sterling Heights, and Kenneth J. Cook, Troy, both of Mich., assignors to The Valeron Corporation, Oak Park, Mich.

Filed Mar. 1, 1978, Ser. No. 882,357
Int. Cl.[2] G06T 1/00; G06G 7/26
U.S. Cl. 364—607 **20 Claims**



16. An electronic circuit for generating a simulated electrocardiogram waveform, comprising:

multistage counter means for sequentially providing an output signal at each stage;

a plurality of analog signal shaping circuits each coupled to a stage of the counter, said shaping circuits including:

a resisitive-capacitive integrator to form a P segment of said simulated electrocardiogram waveform;

a resistive-capacitive integrator having an input and output, and an inverting amplifier connected to the output of said resistive-capacitive integrator to form a Q segment of said simulated electrocardiogram waveform;

a resisitive-capacitive differentiator having an input and an output, a unidirectional conductive means connected to the output of said resistive-capacitive differentiator, and a resistive-capacitive integrator connected to the output of said

resistive-capacitive differentiator to form an R segment of said simulated electrocardiogram waveform;

a resistive-capacitive integrator having an input and an output, and an inverting amplifier having an input connected to the output of said resistive-capacitive integrator to form an S segment of said simulated electrocardiogram waveform;

a resistive-capacitive integrator having two inputs and one output to form a T segment of said simulated electrocardiogram waveform; and

means for summing the outputs of the analog signal shaping circuits to provide a completed simulated electrocardiogram waveform.

20. In a biological waveform simulator device, an electronic circuit for modulating a carrier frequency signal with an information containing signal for transmission to a remote device, comprising:

analog switch means having two signal inputs and a power supply input for energizing components thereof, said switch means operative to amplitude modulate said carrier frequency signal on one input with said information signal on the other input wherein the amplitude modulated signal is transmitted to the remote device; and

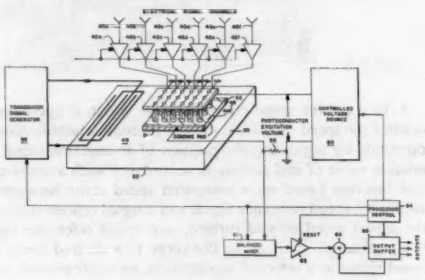
power supply means operative to rectify said carrier frequency signal and coupling the rectified output to the power supply input of the switch means to thereby power said analog switch means.

4,204,262

OPTICAL SIGNAL PROCESSING APPARATUS

Michael M. Fitelson, 214 Stonecrest Dr., Dewitt, N.Y. 13214, and Dennis R. Morgan, 7734 Forestwag Ct., Liverpool, N.Y. 13088

Filed May 25, 1977, Ser. No. 800,155
Int. Cl.[2] G06G 9/00, 7/19
U.S. Cl. 364—822 **9 Claims**



1. A simultaneous space and time signal processing apparatus for use with a source of a plurality of phase-related time-varying input signals, comprising:

(a) acousto-optic means including a strain-sensitive light transmissive medium and means for inducing time and space varying strain disturbances in said medium;

(b) a light source array comprising a plurality of light sources of number corresponding to the number of said time-varying signals and spatially interrelated correspondingly to the phase relationships of said input signals, each of said light sources being driven by one of said input signals to produce a light output signal corresponding to the drive signal amplitude and being positioned adjacent said medium to project such light output signals thereon, the light signals thus incident upon said acousto-optic means being modulated by said light transmission medium in accordance with the time and space varying strain disturbances therein;

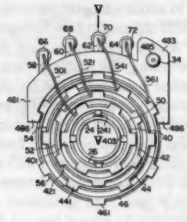
(c) means for sensing the light signals incident upon and modulated by said acousto-optic means and for deriving therefrom an electrical signal which is representative of the summed amplitudes of the light signals so sensed; and

(d) means for demodulating said electrical signal to produce an output signal representative of the time-varying input signals having a predetermined phase relationship.

4,204,263
FLYBACK TRANSFORMER

Shoji Onoue, Tokyo, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,284
Claims priority, application Japan, Apr. 20, 1977, 52-45578; Apr. 22, 1977, 52-51025[U]
Int. Cl.[2] H02M 7/06; H01F 27/30
U.S. Cl. 363—68 7 Claims

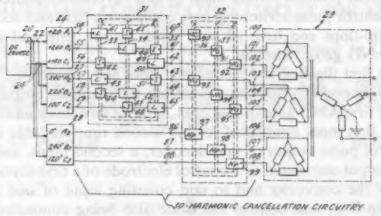


1. A flyback transformer comprising a magnetic core, primary and secondary windings wound around said magnetic core, said secondary winding including a plurality of coil units and a plurality of rectifying diodes, said coil units and said rectifying diodes being alternately connected in series, a coil bobbin on which said primary winding is wound, a plurality of concentric layer bobbins with different diameters on which said secondary winding is wound, each of said coil units being wound in a single layer around each of said layer bobbins, means for forming a predetermined space between said layer bobbins when the layer bobbins are assembled in layers and means mounted on an outermost layer bobbin of said layer bobbins for supporting said rectifying diodes.

4,204,264
HARMONIC CANCELLATION FOR MULTI-BRIDGE, THREE-PHASE CONVERTERS

Kenneth Lipman, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 27, 1978, Ser. No. 964,305
Int. Cl.[2] H02M 1/12
U.S. Cl. 363—71 4 Claims



1. A method of cancelling the signal harmonics of the output fundamental signals of a three-phase converter, each output fundamental signal provided as the sum of equal phase angle fundamental signals from one of three sets of corresponding phase outputs of an N number of converter bridges, where N is a non-power of two, comprising the steps of:

adjusting the phase angle of the fundamental signals to provide a phase displacement of the fundamental signals of each bridge by 60/N degrees relative to the fundamental signals provided at corresponding phase outputs of at least one other bridge;

grouping the highest power of two number of bridges in a first group and all the remaining bridges in a second group;

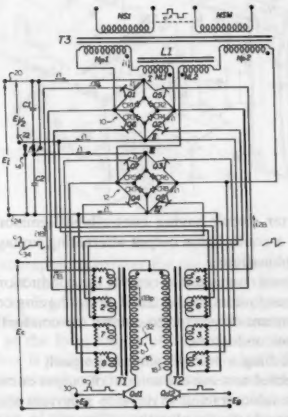
adding to each displaced fundamental signal in said first group and said second group, the difference signal magnitude between the particular fundamental signal and the displaced fundamental signals from corresponding phase outputs in the related one of said groups and the difference signal magitude between displaced fundamental signals of at least one other set of corresponding phase outputs of the related ones of said groups, to provide a first group fundamental signal for each displaced fundamental signal in said first group and a second group fundamental signal for each displaced fundamental signal in said second group, each having a phase angle corresponding to one of the converter phases, said second group fundamental signals having all signal harmonics of an order less than 6·N−1 displaced by one hundred eighty degrees from the equal order signal harmonics of said first group fundamental signals of equal phase angle; and

summing said first group fundamental signals with said second group fundamental signals having equal phase angle to provide a sum fundamental signal for each set of corresponding phase outputs from the N bridges, each sum fundamental signal representative of the output fundamental signal in one phase of the three-phase converter, each having a first harmonic of order (6·N−1).

4,204,265
STATIC CONVERTER SUITABLE FOR HIGH INPUT VOLTAGE APPLICATIONS

James A. McLeod, 224 Unit N, Red Oak Dr. East, Sunnyvale, Calif. 94086

Filed Aug. 14, 1978, Ser. No. 933,157
Int. Cl.[2] H02M 7/537
U.S. Cl. 363—71 10 Claims



1. A static converter, comprising:

first and second input terminals across which a power supply potential may be applied;

drive signal generating means for developing first and second drive signals that are 180° out of phase relative to each other;

output transformer means including first and second primary windings wound about a common magnetic core, and at least one secondary winding across which a load may be connected;

current balancing inductor means including first and second inductor windings wound in opposite directions about a common magnetic core; and

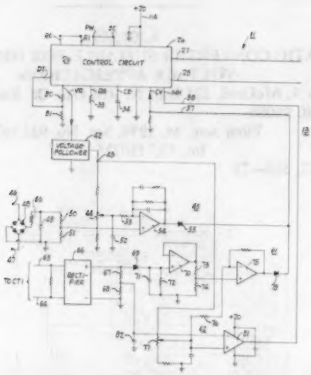
first and second bridge means connected across said first and second terminals, said first and second bridge means being responsive to said first drive signal and operative to couple a first circuit including said first primary winding and said first inductor winding connected in series, and a

second circuit including said second primary winding and said second inductor winding connected in series across said first and second pair of input terminals such that current flows therethrough in one direction, said first and second bridge means being responsive to said second drive signal and operative to couple said first circuit and said second circuit across said first and second pair of input terminals such that current flows therethrough in the opposite direction, said inductor windings insuring that during the switching times the current through the last bridge to turn OFF or through the first bridge to turn ON will be held to a predetermined level.

4,204,266
INVERTER DRIVE CIRCUIT

Neil Kammiller, Lakewood, and Pantelis P. Paradissis, Amherst, both of Ohio, assignors to Lorain Products Corporation, Lorain, Ohio

Filed Jul. 28, 1978, Ser. No. 928,864
Int. Cl.[2] H02P *13/18*
U.S. Cl. 363—98 **32 Claims**



1. An inverter circuit having controllable semiconductors connected for a controllable output alternating voltage, comprising, in combination:

a control circuit connected to control the conduction time of said semiconductors, said control circuit having controllable input means connected to control the conduction time of said semiconductors;

means establishing a voltage reference signal;

means connected to sense the amount of output current from said semiconductors and to develop a current signal;

rectifier means having a plurality of outputs connected to rectify a signal proportional to said current signal;

a current limit setting potentiometer connected to said reference voltage signal to establish a reference signal representative of a maximum value of inverter output current;

a first current limit means including

(i) an operational amplifier connected as a comparator and having first and second inputs;

(ii) means connecting said comparator first input to one of the outputs of said rectifier means; and

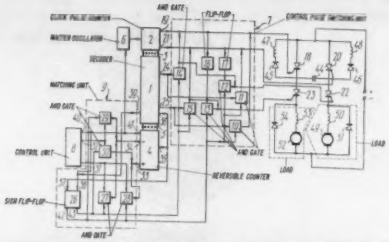
(iii) means connecting said current limit setting potentiometer reference signal to said second input of said comparator; and

means connecting the output of said comparator to said controllable input means of said control circuit whereby the output voltage of said inverter is decreased upon the output of said comparator changing state when said rectified signal exceeds said reference signal.

4,204,267
DIGITAL CONTROL DEVICE FOR D.C. THYRISTOR-PULSE CONVERTER

Anatoly Y. Kalinichenko, Moscow, U.S.S.R., assignor to Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia, Moscow, U.S.S.R.

Filed Apr. 10, 1978, Ser. No. 895,276
Int. Cl.[2] H02P *13/24*
U.S. Cl. 363—85 **1 Claim**



1. A digital control device for controlling a d.c. thyristor-pulse converter, comprising:

a decoder having first and second information inputs, a first time-shiftable control pulse output, a second time-shiftable control pulse output, a first switching output of control pulses for switching control stages, and a second switching output of control pulses for switching control stages;

a clock pulse counter having an input, a first time-fixed control pulse output, a second time-fixed control pulse output, and information outputs connected to said first information inputs of said decoder;

a master oscillator having an input, and an output connected to said input of said clock pulse counter;

a reversible counter having a reset input connected to said first switching output of said decoder, an initial state setting input, a subtract input, an add input, and information outputs connected to said second information inputs of said decoder;

a control unit having a position selection output, a position return output, and an initial position setting output connected to said input of said master oscillator and to said initial position setting input of said reversible counter;

a control pulse switching unit comprising first and second flip-flops and first, second, third, fourth, fifth and sixth AND gates; wherein

said first flip-flop has a counting input and an output;

said second flip-flop has a counting input and an output;

said first AND gate of said control pulse switching units has a first input connected to said second time-shiftable control pulse output of said decoder, a second input, and an output connected to a control electrode of a first thyristor of the converter and to said counting input of said first flip-flop, said control electrode also being connected to said first output of said clock pulse counter;

said second AND gate of said control pulse switching unit has a first input connected to said first time-shiftable control pulse output of said decoder, a second input, and an output connected to a control electrode of a second thyristor of the converter and to said counting input of said second flip-flop, said control electrode also being connected to said second output of said clock pulse counter;

said third AND gate of said control pulse switching unit has a first input connected to said output of said second flip-flop, a second input, and an output connected to a control electrode of a third thyristor of the converter;

said fourth AND gate of said control pulse switching unit has a first input connected to said output of said first flip-flop, a second input, and an output connected to a control electrode of a fourth thyristor of the converter;

said fifth AND gate of said control pulse switching unit has a first input connected to said first time-shiftable control pulse output of said decoder, a second input, and an output connected to said control electrodes of said first and third thyristors of the converter; and

said sixth AND gate of said control pulse switching unit has a first input connected to said second time-shiftable control pulse output of said decoder, a second input, and an output connected to said control electrodes of said second and fourth thyristors of the converter; and

a matching unit for matching the states of said control pulse switching unit and of said reversible counter with the state of said control unit comprising a sign flip-flop and first, second, third and fourth AND gates; wherein

said sign flip-flop of said matching units has a first input connected to said first switching output of said decoder, a second input connected to said second switching output of said decoder and to said initial state setting output of said control unit, a first output connected to said second inputs of said first, second, third and fourth AND gates of said control pulse switching unit, and a second output connected to said second inputs of said fifth and sixth AND gates of said control pulse switching unit;

said first AND gate of said matching unit has a first input connected to said position selection output of said control unit, a second input connected to said second output of said sign flip-flop, and an output connected to said subtract input of said reversible counter;

said second AND gate of said matching unit has a first input connected to said position selection output of said control unit, a second input connected to said first output of said sign flip-flop, and an output connected to said add input of said reversible counter;

said third AND gate of said matching unit has a first input connected to said position return output of said control unit, a second input connected to said first output of said sign flip-flop, and an output connected to said subtract input of said reversible counter; and

said fourth AND gate of said matching unit has a first input connected to said position return output of said control unit, a second input connected to said second ouput of said sign flip-flop, and an output connected to said add input of said reversible counter.

4,204,268

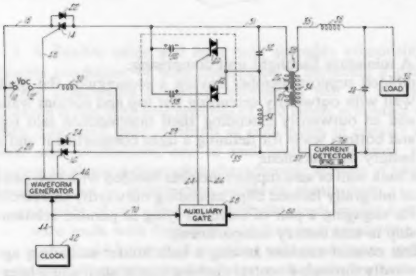
AUXILIARY COMMUTATION CIRCUIT FOR AN INVERTER

Joseph R. Vivirito, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 930,469, Aug. 2, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 973,339

Int. Cl.² H02M *7/515*

U.S. Cl. 363—135 **10 Claims**



1. An inverter for converting DC electrical energy into an output waveform having a substantially sinusoidal fundamental component, comprising:

an input means for receiving electrical energy from a DC source;

semiconductor switch means coupled to said input means, including a means for providing a control waveform of a frequency related to said fundamental sinusoidal component to said semiconductor switch means for periodically translating said switch means between its nonconducting and its conducting states;

main commutation means connected to said semiconductor switch means which stores electrical energy for commutating the semiconductor switch means to its nonconducting state; and

auxiliary means including a pair of capacitors on which electrical energy is stored during inverter operation, and which is operable in response to an overcurrent condition for providing additional electrical energy for commutation.

4,204,269

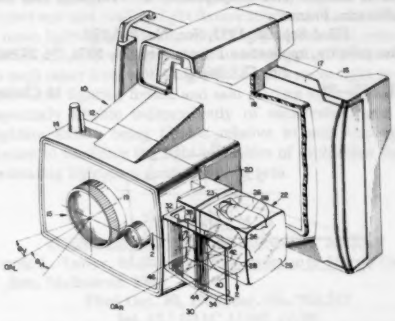
OPTICAL ELEMENT FOR REDISTRIBUTING THE LIGHT OUTPUT OF A PHOTOFLASH LAMP ASSEMBLY OR THE LIKE

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 27, 1977, Ser. No. 864,316

Int. Cl.² G03B *15/02*

U.S. Cl. 362—17 **22 Claims**



1. Photographic apparatus for use with an artificial lighting assembly of the type which includes an inwardly curving reflector having a given focal length and optical axis and an artificial light source having a principal diameter that is at least one-half of the focal length of the reflector and wherein the light source is positioned along the optical axis of the reflector so that the intensity of the illumination provided by the artificial lighting assembly at any point on a plane normal to the optical axis of the reflector decreases as the point's distance from the optical axis of the reflector increases, said apparatus comprising:

means for mounting the artificial lighting assembly so that light therefrom can be directed toward a scene to be photographed; and

optical means, mounted in a predetermined spaced apart relationship with the lighting assembly, for intercepting rays of light from the artificial lighting assembly to change the angular direction of travel of at least certain of such rays such that the distribution of illumination intensity provided by the artificial lighting assembly on the normal plane is changed to a preferred distribution which is more uniform over the normal plane, said optical means comprising a transparent, generally planar member having a first surface facing the scene and a second surface, spaced from said first surface, facing the artificial lighting assembly, said second surface being configured to define a refracting surface of predetermined size centrally disposed

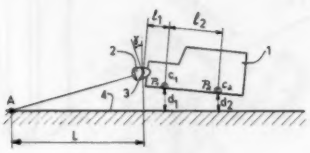
about the optical axis of the reflector, the index of refraction of said transparent member being selected and said refracting surface being structured to operate by total internal reflection to retroreflect rays from the scene which are incident normal to said first surface, rays from the artificial lighting assembly which are parallel with the optical axis of the reflector and incident on said refracting surface thereby being deviated by said refracting surface to locations on the normal plane which are further removed from the optical axis of the reflector, and rays from the artificial lighting assembly which are incident upon said refracting surface at angles oblique to the optical axis of the reflector being diviated by said refracting surface such that the distribution of the intensity of illumination on the normal plane attributed exclusively to such oblique rays remains substantially unchanged.

4,204,270

METHOD AND APPARATUS FOR ADJUSTING THE ORIENTATION OF VEHICLE HEADLIGHTS

Emmanuel H. Poirier d'Ange d'Orsay, Toulouse, France, assignor to Societe pour l'Equipement de Vehicules, Issy-les-Moulineaux, France

Filed Sep. 26, 1977, Ser. No. 836,897
Claims priority, application France, Sep. 24, 1976, 76 28796
Int. Cl.[2] B60Q 1/10
U.S. Cl. 362—71 **16 Claims**



4. Apparatus for adjusting the position of a headlight with respect to the body of a vehicle comprising, a headlight, means mounting the headlight for adjustment about an axis parallel to the roadway and perpendicular to the vehicle path, motor means for rotating the headlight to an adjustment angle α with respect to the vehicle body, a first sensor C_1 mounted near the front of the vehicle for sensing the height d_1 of the vehicle body relative to the roadway at a point P_1 of the vehicle body, a second sensor C_2 mounted near the rear of the vehicle for sensing the height d_2 of the vehicle body relative to the roadway at a point P_2 near the rear of the vehicle body, means for deriving a voltage $V_1(\alpha_o)$ indicative of the desired angle α, where

$$V_1(\alpha_o)=K_1(d_2-d_1)+K_2d_1+K_3,$$

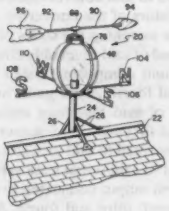
K_1, K_2 and K_3 being constants, and K_1 and K_2 being related by the expression $K_1l_2+K_2l_1=1$, where l_1 is the distance between the axis of rotation of the headlight and point P_1 projected on a line P_1P_2 through the points P_1 and P_2, and l_2 is the distance between points P_1 and P_2, sensing means for generating a voltage V (α) indicative of the angle α between the headlight and the vehicle body, means for comparing $V_1(\alpha_o)$ with V (α), and means responsive to a difference between $V_1(\alpha_o)$ and V (α) for generating a signal to operate said motor means to adjust the headlight to cause said voltage V (α) to substantially equal $V_1(\alpha_o)$.

4,204,271

ILLUMINATED WEATHER VANE

Henry L. Braly, 5 Neptune Dr., Mumford Cove, Groton, Conn. 06340

Filed Feb. 13, 1978, Ser. No. 877,252
Int. Cl.[2] F21S 1/02, 3/10
U.S. Cl. 362—145 **8 Claims**



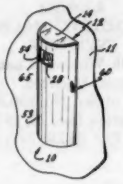
1. An illuminated weather vane assembly comprising:
a base;
a lamp socket mounted on said base;
a translucent globe supported on said base enclosing said lamp socket;
a vane support member mounted adjacent said globe distant from said base including an upright pivot shaft secured thereto at one end and having a free end tapered to a point directed away from said base;
a plurality of globe support bars mounted, respectively, to said base and said support member and encircling said globe in a contiguous manner; and
a wind direction vane including a conical bearing substantially equidistant from its ends adapted to be freely received on the free end of said pivot shaft.

4,204,272

MINIATURE FLASHLIGHT UNIT

Sunyong P. Kim, 535 N. Cahuenga Blvd., Los Angeles, Calif. 90004

Filed Sep. 11, 1978, Ser. No. 941,039
Int. Cl.[2] F21L 7/00
U.S. Cl. 362—200 **7 Claims**



1. A miniature flashlight unit comprising:
a molded support member having a rectangular flat back wall with outwardly extending flat top and bottom walls and an outwardly extending shelf intermediate said top and bottom walls for defining a light compartment and a battery compartment;
the back wall of said support member molded with two pairs of integrally formed clips extending outwardly therefrom for engaging a pair of batteries lying in parallel relationship in said battery compartment;
a first contact member having a bulb holder extending upwardly through a central opening in said shelf and a laterally extending mounting portion disposed below said shelf and including a spring strip portion extending downwardly and inwardly so as to engage the top of one of said batteries;
a bulb in said bulb holder;

a second contact member having a laterally extending mounting portion disposed below said shelf and including an upper laterally inwardly extending spring strip portion for engaging the base terminal of the bulb disposed in said bulb holder and a lower laterally inwardly extending spring strip portion for engaging the top of the other of said batteries;

a third contact member having a central mounting portion disposed in the bottom wall and having a first upwardly and outwardly extending spring strip portion on one side thereof contacting the bottom of one of said batteries and a second upwardly and outwardly extending spring strip portion on the other side thereof contacting the bottom of the other of said batteries;

said bulb disposed in said bulb holder having a relative flat face with an integrally formed lens thereon having a short focal length for directing the available light rays of the bulb onto a desired area to be illuminated; and

a molded cover for fitting over and engaging the outer peripheries of the top and bottom walls and the intermediate shelf, said cover having an opening therein opposite the lens on the face of said bulb to permit the light rays thereof to pass therethrough to illuminate the area.

4,204,273

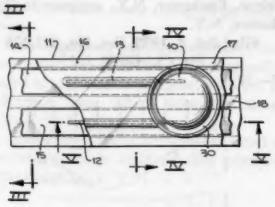
CONSTRUCTION OF ILLUMINATING RIBBON OF LIGHT BULBS

Gerald M. Goldberg, 10501-1 Larwin Ave., Chatsworth, Calif. 91311

Continuation of Ser. No. 764,385, Jan. 31, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,657

Int. Cl.² F21S *3/00*

U.S. Cl. 362—217 **3 Claims**



1. A flexible cable and light bulb assembly comprising: a flexible conductor of strip configuration including a pair of copper conductors laminated between a pair of insulating material layers with first portions of said layers in contact with each other and other portions of said layers in contact only with said conductors, one of said layers comprising vinyl having an elastic deformation characteristic capable of taking a temporary set on deformation within its elastic limit;

a plurality of incandescent light bulbs, each having a pair of wire leads with free ends said free end penetrating said one of said layers and engaging said conductors; and

means for retaining said bulbs to said conductor with said leads free ends held in electrical contact laterally against said conductors, said means for retaining including portions of said vinyl layer overlying said leads, engaging and pressing said free ends laterally against said conductors.

4,204,274

WALL LIGHT FIXTURE, PARTICULARLY FOR HOSPITAL ROOMS

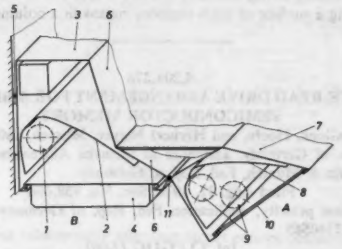
Willi Lüderitz, Westerbachstrasse 27, 4990 Lübbecke, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,514

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 7719975[U]

Int. Cl.² F21V *1/00*

U.S. Cl. 362—239 **12 Claims**



1. A wall light fixture arrangement for hospital rooms, sickrooms and the like, comprising: a room light fixture; a reading light fixture; means for connecting said room light fixture and said reading light fixture; and means for tilting said room light fixture and said reading light fixture relative to each other from a room lighting position to a reading position, said room light fixture and said reading light fixture being also tiltable relative to each other from a reading position to a room light position; said room lighting fixture and said reading light fixture being separately tiltable independently of each other, said room lighting fixture being tiltable relative to said reading light fixture to reinforce the light intensities of each other for concentrating light on a predetermined area.

4,204,275

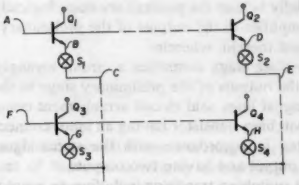
UNISOLATED EAROM MEMORY ARRAY

David L. Taylor, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 20, 1978, Ser. No. 953,317

Int. Cl.² G11C *11/40, 13/00*

U.S. Cl. 365—163 **8 Claims**



4. A bipolar monolithic memory array comprising:

an N-conductivity type substrate;

a plurality of P-conductivity type regions in said substrate each of said P-conductivity type regions extending laterally and being spaced from each other in a longitudinal direction to form a plurality of longitudinally spaced rows of P-conductivity type regions,

a plurality of N-conductivity type regions located within each of said P-type regions, the N-conductivity type regions within a P-conductivity type region being spaced laterally from each other,

a plurality of memory means for programably retaining a logic state, one of said memory means being associated

with each N-conductivity type region, each of said memory means being aligned in a longitudinal direction with its respective N-conductivity type region to form columns of memory means;

a plurality of laterally extending conductors each contacting a P-conductivity type region at a plurality of surface areas, each of said surface areas being associated with and being longitudinally aligned with a different one of each of the N-conductivity type regions associated with said P-conductivity type region forming a row; and

a plurality of logitudinally extened conductors each contacting a surface of each memory means in a column.

4,204,276

WRITE-READ DRIVE ARRANGEMENT FOR A BIPOLAR SEMICONDUCTOR MEMORY

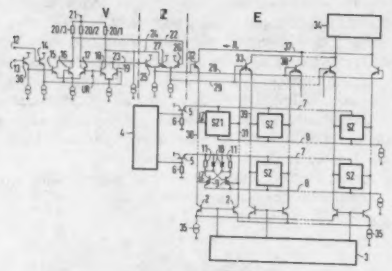
Hans Glock, Hoefa, and Herbert Mayer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 31, 1978, Ser. No. 938,408

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740565

Int. Cl.² G11C *11/40*

U.S. Cl. 365—189 **2 Claims**



1. In a driving arrangement for driving a bipolar semiconductor memory arranged in the form of a matrix having switching transistors, bit lines and read amplifier means, of the type wherein a preliminary stage includes a write-in and data input and has two information outputs and a status output which is fed with operating state signals, and an intermediate stage and an end stage, with first and second signal lines, connected serially behind the preliminary stage logically linking a read-out amplifier to the outputs of the preliminary stage, the improvement therein, wherein:

the intermediate stage comprises a circuit arrangement connecting the outputs of the preliminary stage to the first and second signal lines, said circuit arrangement comprising

a first switching transistor having an input connected to and operated in accordance with the status signals on the status output and having two outputs;

a second switching transistor including an input connected to and operated by one of the information outputs and an output connected to one of the outputs of said first switching transistor and to the first signal line of the end stage; and

a third switching transistor having an input connected to and operated by another of the information inputs and an output connected to the other output of said first switching transistor and to the second signal line of the end stage; and

the matrix includes a maximum of one additional switching transistor for each bit line connected to and driven by a selected signal line to connect the respective bit line to the read amplifier means.

4,204,277

DYNAMIC READ-WRITE RANDOM ACCESS MEMORY

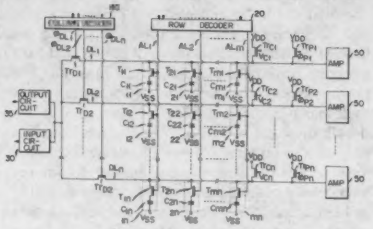
Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 10, 1978, Ser. No. 876,947

Claims priority, application Japan, Feb. 10, 1977, 52-13899

Int. Cl.² G11C *11/40*

U.S. Cl. 365—203 **13 Claims**



2. A dynamic read-write random access memory which comprises (a) a plurality of data lines; (b) a plurality of memory cells with each cell selectably connected to one of said corresponding data lines to drive said one of said data lines toward one of first and second reference potentials depending upon the stored content of said cell; and (c) an MOS transistor connected between each of said data lines and terminals having said second reference potential; and (d) means for supplying the gates of said transistors with a potential deviation preventing voltage sufficient to prevent the potential of said data lines from being deviated from said first reference potential in an opposite direction to that of said second reference potential to minimize loss of said content of any of said cells which are not being accessed.

4,204,278

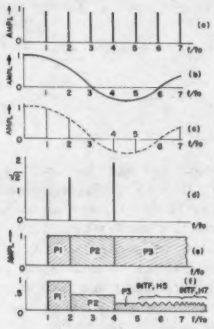
METHODS AND APPARATUS FOR THE GENERATION AND TRANSMISSION OF SIGNALS FOR ECHO LOCATION AND OTHER SIGNALLING PURPOSES, AS IN GEOPHYSICAL EXPLORATION

David E. Nelson, Rochester, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,405

Int. Cl.² G01V *1/22*

U.S. Cl. 367—39 **32 Claims**



1. The method of transmitting signals having a spectrum extending over a frequency range of more than an octave with the energy due to certain spectral harmonics minimized, which comprises the steps of

generating repeatedly at least one signal having a waveform with at least two levels which divide the duration of the

signal in proportion to the order of the spectral harmonics which are to be minimized, and

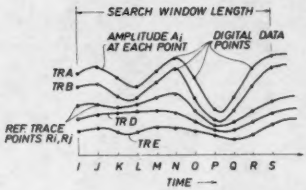
changing the duration of said signal as it is repeated during said transmission with the ratio of the duration of the longest to the shortest signal not exceeding a factor of 2 to 1 such that the repetition frequency of said signal sweeps over an octave.

4,204,279

METHOD FOR ENHANCING SEISMIC DATA

Alvin L. Parrack, Bellaire, and Delbert R. Lunsford, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 1, 1972, Ser. No. 230,810
Int. Cl.[2] G01V 1/36
U.S. Cl. 367—40 **21 Claims**



1. A machine implemented method for enhancing digital data in a seismic record, said data having a coherent signal component comprising a measure of the similarity between spatially related time series data, and a noise component, and for improving the signal to noise ratio thereof, comprising the steps of:

determining, for a search window defined about a selected time on a selected seismic reference trace, the coherent signal associated with said reference trace and a plurality of adjacent seismic traces;

computing, by use of said coherent signal, the component of said coherent signal extant in said reference trace and replacing in time alignment with said reference trace on an output signal record medium, that portion of said reference trace included in said search window with said component of the reference trace comprising said coherent signal portion;

replacing, in time alignment with said reference trace on an output noise record medium, that portion of said reference trace included in said search window, with the remainder of said reference trace which does not comprise said coherent signal portion; and

repeating the above steps for other selected times and other selected reference traces until all data comprising said record is so processed.

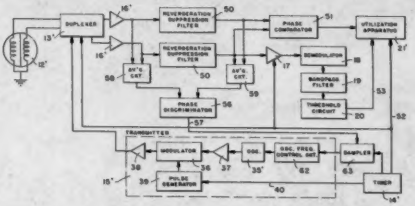
4,204,280

UNDERWATER SIGNAL DISCRIMINATION SYSTEM

Jack H. Slaton, Arcadia, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1962, Ser. No. 239,384
Int. Cl.[2] G01S 9/66
U.S. Cl. 367—95 **13 Claims**

1. In an underwater-target detection apparatus of the echo-ranging type wherein a receiver signal, resulting from transmission of search pulses, comprises reverberation and at times a target echo, said reverberation presenting a frequency spectrum of greater bandwidth than said target echo and presenting an amplitude-modulation envelope generally including pulses of character similar to said search pulses, and said target echo occurring at an unpredictable frequency within a comparatively wide frequency band substantially centered upon the reverberation mean frequency, a receiver circuit for effecting discrimination of target echoes from reverberation, said receiver circuit comprising: first filter means having a rejection notch characteristic centered upon the reverberation mean frequency, and of comparatively limited bandwidth substantially matching that of the major energy portion of said reverberation, for converting said receiver signal to a modified signal with strong attenuation of reverberation in only a correspondingly limited central portion of its frequency spectrum



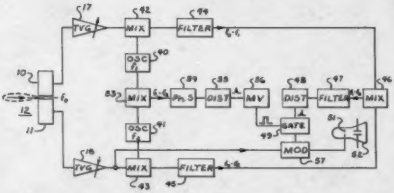
and without substantially affecting target echoes occurring at frequencies outside of said rejection notch; demodulator means for deriving from said modified signal a unipolar signal corresponding to the modulation envelope of said modified signal; and second filter means having a bandpass response characteristic with upper cutoff frequency substantially equal to half said limited bandwidth of the first filter means rejection notch, for isolating, from said unipolar signal, only such signal pulses as correspond to target echoes.

4,204,281

SIGNAL PROCESSING SYSTEM FOR UNDERWATER TRANSDUCER

Julius Hagemann, 412 S. MacArthur Ave., Panama City, Fla. 32407

Filed Mar. 24, 1959, Ser. No. 801,674
Int. Cl.[2] G01S 9/66, 3/84
U.S. Cl. 367—98 **4 Claims**



1. A high resolution sound wave detecting system having a fanshape beam of receiver sensitivity comprising a pair of transducers having elongated active faces coplanar and in end to end relation, an output signal channel for each transducer, means including two local oscillators of different frequencies connected to heterodyne against each other for producing timing pulses having a repetition rate equal to the frequency difference of said oscillators and individually against the output signals in the two transducer channels, means for mixing the beat frequencies of the heterodyned output signals and producing therefrom signal pulses having a repetition rate equal to the frequency difference of said oscillators, an output circuit, and means responsive to a signal pulse and a timing pulse coinciding in time for passing the signal pulse to the output circuit.

DESIGN PATENTS

GRANTED MAY 20, 1980

ERRATA

For CLASS	See PATENT NO.
D27–036	255,046
D26–104	255,055

DESIGN PATENTS

GRANTED MAY 20, 1980

ERRATA

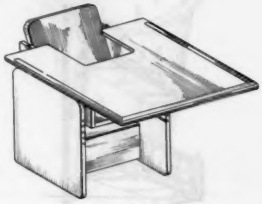
For	See
CLASS	PATENT NO.
D27-059	252,049
D29-104	252,075

254,996
SUPPORT FOR AN EAR PROTECTOR
Bo G. Lönnstedt, Kvarnbergsvägen 23, S-141 45 Huddinge, Sweden
Filed Jan. 9, 1978, Ser. No. 868,279
Claims priority, application Sweden, Jul. 7, 1977, 771485
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233

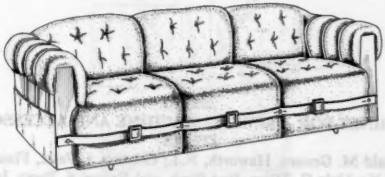
254,997
SHOE SOLE
Robert B. Hanson, Ballwin, Mo., assignor to Brown Group, Inc., St. Louis, Mo.
Filed Nov. 15, 1977, Ser. No. 851,808
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322

254,998
PORTABLE PODIUM
Donald O. Espeseth, Diamond Bar, Calif., assignor to Wilstac Inc., Los Angeles, Calif.
Filed Jan. 30, 1978, Ser. No. 873,284
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—27

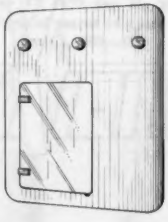
254,999
COMBINED CHAIR AND TRAY FOR THE HANDICAPPED
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Jan. 30, 1978, Ser. No. 873,163
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42



255,000
SOFA
Walter F. Dybal, Westminster, Calif., assignor to Shelly & Anderson Furniture Mfg. Co., Inc., Compton, Calif.
Filed Feb. 16, 1978, Ser. No. 878,950
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

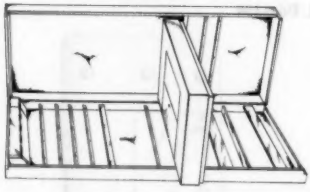


255,001
CABINET
Yolanda Quitman, 1459 Hewlett Ave., Hewlett, N.Y. 11557
Filed Jan. 25, 1978, Ser. No. 872,323
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—104



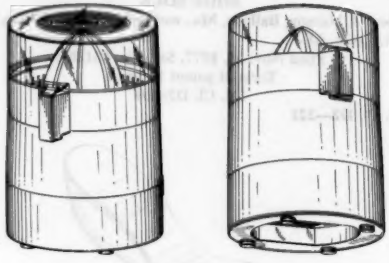
255,002
COMBINED SHELF AND DRAWER UNIT
Domingo V. Otero, Gran Via St. No. 110, Vigo (Pontevedra), Spain
Filed Aug. 10, 1977, Ser. No. 823,520
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—129

255,003
CABINET FOR A SEWING MACHINE AND ACCESSORY ITEMS
Donald M. Genaro, Haworth, N.J.; Cristian J. Felix, Flushing, N.Y.; Alvin R. Tilley, Red Bank, and Robert S. Peets, Island Heights, both of N.J., assignors to The Singer Company, Stamford, Conn.
Filed Jan. 19, 1978, Ser. No. 870,915
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167



255,004
TABLE BASE
Robert K. Thorpe, Newport Beach, Calif., assignor to The Charlton Company, Compton, Calif.
Filed Dec. 27, 1977, Ser. No. 864,220
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

255,005
FRUIT JUICER, OR SIMILAR ARTICLE
Nathan Fuchs, Brooklyn, N.Y., assignor to Van Wyck International Corporation, New York, N.Y.
Filed May 19, 1978, Ser. No. 907,762
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—49



255,006
KNIFE HOLDING BOARD
George A. Pallotta, Jr., 3430 Milbert Dr., Salt Lake City, Utah 84106
Filed Jun. 15, 1977, Ser. No. 804,862
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—74

255,007

KNIFE HOLDING BOARD

George A. Pallotta, Jr., 3430 Milbert Dr., Salt Lake City, Utah 84106

Filed Jun. 15, 1977, Ser. No. 804,863

Term of patent 14 years

Int. Cl. D07—*06*

U.S. Cl. D7—74

255,008

COOKING APPLIANCE HANDLE

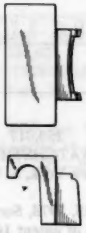
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and Robert W. Becker, Naperville, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Filed Oct. 3, 1977, Ser. No. 838,922

Term of patent 14 years

Int. Cl. D07—*02*

U.S. Cl. D7—132



255,009

BURNER

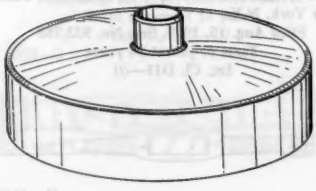
Stephen H. Matusiak, and Gerald W. Matusiak, both of Etobicoke, Canada, assignors to Almatic Industries Limited, Mississauga, Canada

Filed Oct. 7, 1977, Ser. No. 840,508

Term of patent 14 years

Int. Cl. D23—*03;* D7—*02*

U.S. Cl. D7—136



255,010

PRODUCE HAMPER

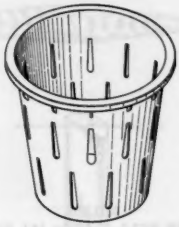
Peter K. Boller, Willowdale, Canada, assignor to Consumers Glass Company Limited, Etobicoke, Canada

Filed Feb. 10, 1977, Ser. No. 767,436

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—220



255,011

CARTON BLANK

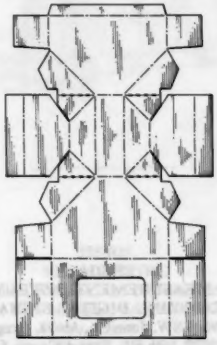
Leonard M. Cooper, Kankakee, and Gary L. Adreon, Bourbonnais, both of Ill., assignors to Olinkraft, Inc., Denver, Colo.

Filed Dec. 2, 1977, Ser. No. 856,828

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—245



255,012

DISPENSER CAP FOR A PRESSURIZED CONTAINER

Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Baton Rouge, La.

Filed Nov. 17, 1977, Ser. No. 852,340

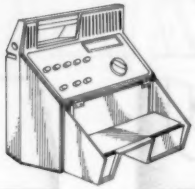
Term of patent 14 years

Int. Cl. D09—*07*

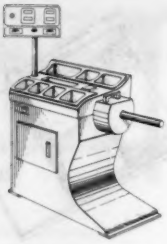
U.S. Cl. D09—258

255,013
THERMOMETER SUPPORT BASE
John F. O'Brien, and Gary R. Keithley, both of Dayton, Ohio, assignors to Magic Touch Manufacturing Corp., Dayton, Ohio
Filed Jan. 27, 1978, Ser. No. 872,882
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60

255,014
TEST AND MEASUREMENT INSTRUMENT FOR ANALYZING DIGITAL SIGNALS
James A. Hill, 19605 SW. Jann Ct., Aloha, Oreg. 97005; Edward B. Gerlinger, 3023 16th Pl., Forest Grove, Oreg. 97116; Robert H. Leith, 1444 SE. Brookwood, Hillsboro, Oreg. 97123, and Jaime A. Navia, 5225 SW. Murray Blvd., Beaverton, Oreg. 97005
Filed Mar. 4, 1977, Ser. No. 774,559
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—75



255,015
WHEEL BALANCER
Yukiyoshi Hihara, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan
Filed Dec. 8, 1977, Ser. No. 858,721
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—82



255,016
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,756
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

255,017
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,757
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

255,018
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,758
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

255,019
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,759
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

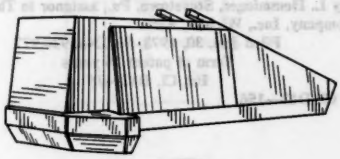
255,020
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,765
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

255,021
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,766
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

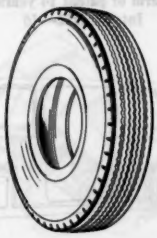
255,022
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,767
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

255,023
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,752
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—15

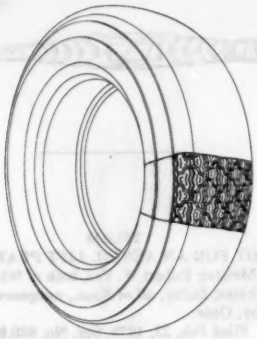
255,024
BODY FOR AN AERIAL LIFT PLATFORM
Michael L. Meister; Robert W. Fee, both of Wichita, and Richard J. Robbins, Derby, all of Kans., assignors to A-T-O Inc., Willoughby, Ohio
Filed Feb. 23, 1978, Ser. No. 880,861
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—61



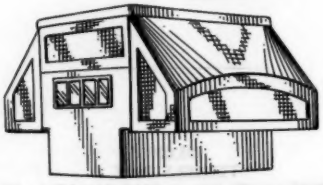
255,025
VEHICLE TIRE
Hiroyoshi Takigawa, Kodaira, and Nobuhiro Miyamura, Higashi Murayama, both of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan
Filed Oct. 18, 1978, Ser. No. 952,881
Claims priority, application Japan, May 4, 1978, 53-18107
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



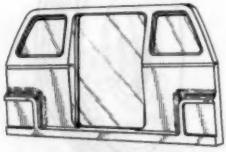
255,026
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed May 1, 1978, Ser. No. 902,286
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



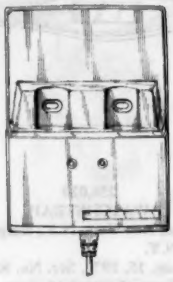
255,027
CAMPER FOR PICK-UP TRUCK
Larry L. Hemminger, Stoystown, Pa., assignor to The Coleman Company, Inc., Wichita, Kans.
Filed Jun. 30, 1978, Ser. No. 920,977
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

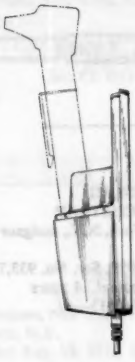


255,028
PICK-UP TRUCK REAR PANEL
John Collins, Elkhart, Ind., assignor to Leer, Inc., Ind.
Filed Mar. 27, 1978, Ser. No. 890,850
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—196

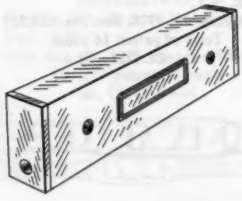


255,029
CHARGER UNIT FOR BATTERY POWERED DIAGNOSTIC INSTRUMENTS
Alan W. Brownlie, Skaneateles, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Dec. 20, 1977, Ser. No. 862,763
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—6

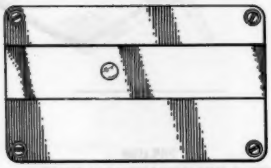




255,030
HOUSING FOR A MAGNETIC CONTACT SWITCH
Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Beaverton, Oreg.
Filed Oct. 23, 1978, Ser. No. 953,581
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

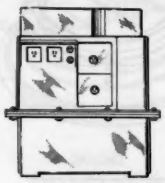


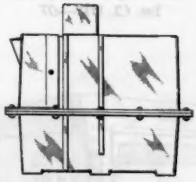
255,031
HOUSING FOR PHOTOELECTRIC SENSOR AND CONTROL CIRCUIT RESPONSIVE THERETO
Anthony R. Lazzara, Portola Valley, Calif., assignor to Scientific Technology, Inc., Mountain View, Calif.
Filed Mar. 6, 1978, Ser. No. 884,038
Term of patent 14 years
Int. Cl. D13—*99, 03*
U.S. Cl. D13—99



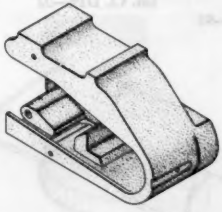
255,032
CONTROL UNIT FOR PAGING SYSTEM
Peter L. Maddock, Sollentuna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Aug. 23, 1978, Ser. No. 936,649
Claims priority, application Sweden, Mar. 3, 1978, 78-0629
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—92

255,033
COMBINED PUMP AND FILTER FOR AQUARIUMS OR THE LIKE
Peter C. Alexson, 1516 River Rd., Corona, Calif. 91720
Filed May 23, 1977, Ser. No. 799,737
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—8

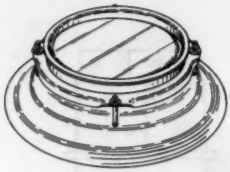




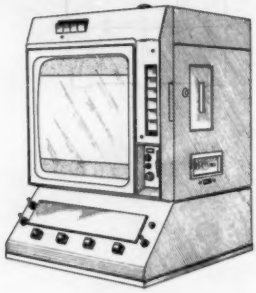
255,034
MACHINE HOUSING FOR BELT-TYPE SURFACE FINISHING TOOL
Walter N. Welsch, Tonawanda, and Elwin H. Fleckenstein, Alden, both of N.Y., assignors to Dynabrade, Inc., Tonawanda, N.Y.
Filed Jul. 29, 1977, Ser. No. 820,361
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126



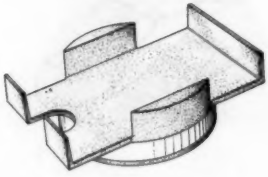
255,035
DRUM
Roger W. North, 1332 SE. 16th, Portland, Oreg. 97214
Filed Sep. 12, 1977, Ser. No. 832,581
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22



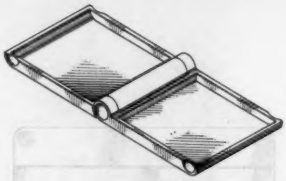
255,036
PSYCHOLOGICAL TEST MACHINE
Rudy J. Horwitz, 1321 Lombard St., Philadelphia, Pa. 19147
Filed May 17, 1978, Ser. No. 907,179
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—60



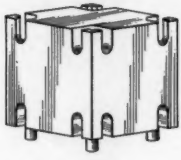
255,037
NOTE PAD HOLDER
Jerome A. Grunstad, West St. Paul, Minn., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Apr. 3, 1978, Ser. No. 893,113
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



255,038
HOUSING FOR USE WITH MANIPULATIVE GAMES
Hitoshi Itakura, Tateishi, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 31, 1978, Ser. No. 873,966
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15



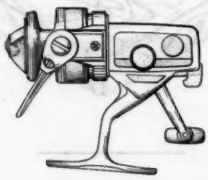
255,039
TOY CONSTRUCTION PIECE
John A. Gale, Excelsior, Minn., assignor to American Guidance Service, Inc., Circle Pines, Minn.
Division of Ser. No. 694,171, Jun. 9, 1976, abandoned. This application Jun. 9, 1976, Ser. No. 913,742
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—108



255,040
BASKETBALL PRACTICE GOAL
Ken C. Cochran, P.O. Box 1073, and Walter Fuller, P.O. Box 535, both of Salina, Kans. 67401
Filed Jan. 23, 1978, Ser. No. 871,412
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—201

255,041
FISHING SIGNAL DEVICE
Lawrence L. Muehl, Frankfort, S. Dak., assignor to Dakota Cateye, Inc., Frankfort, S. Dak.
Filed Feb. 24, 1978, Ser. No. 881,157
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

255,042
FISHING REEL
Kanji Iinuma, Koganei, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Jan. 19, 1978, Ser. No. 870,776
Claims priority, application Japan, Sep. 13, 1977, 52-38195
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



255,043
FISHING LURE
John B. Lapetina, 1862 E. Ocean View Ave., Norfolk, Va. 23503
Filed Feb. 7, 1979, Ser. No. 10,156
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

255,044
FISHING LURE
Philip J. Correa, 566 Fosdick Rd., Carver, Mass. 02330
Filed Feb. 21, 1979, Ser. No. 13,134
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

255,045
FILTER CASING
Dirk G. Kronsbein, Düsseldorf, Fed. Rep. of Germany, assignor to Ultrafilter GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Aug. 26, 1977, Ser. No. 828,194
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1977, 7706092[U]
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

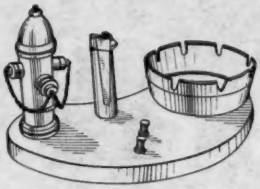
255,046
OPERATING ASSEMBLY FOR A CIGARETTE LIGHTER
Jean Dinh Van, Paris, France, assignor to S. T. Dupont, Paris, France
Filed Jul. 27, 1977, Ser. No. 819,335
Claims priority, application France, Feb. 4, 1977, 77 39960
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

255,047
DISPENSER FOR AIR-TREATING MATERIAL
Arthur W. Müller, Reinach, and Max A. Hissle, Binningen, both of Switzerland, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Mar. 20, 1978, Ser. No. 888,433
Claims priority, application Switzerland, Sep. 23, 1977, 109458/77
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

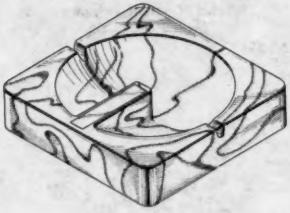
255,048
INTRAMEDULLARY BRUSH
Joseph E. Miller, Westmount, Canada, assignor to Howmedica, Inc.
Filed Oct. 17, 1977, Ser. No. 843,115
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

255,049
BUILDING
William O. Moers, Addison, Ill., assignor to Tenderfoot International, Inc., Melbourne, Fla.
Filed Dec. 4, 1978, Ser. No. 965,733
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

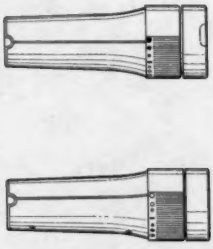
255,050
SMOKER'S STATION
Jacob Wacker, and Joanne Wacker, both of Highland Park, N.J., assignors to J & J Wacker Inc., Highland Park, N.J.
Filed Apr. 10, 1978, Ser. No. 894,907
Term of patent 14 years
Int. Cl. D27—*03, 05*
U.S. Cl. D27—16



255,051
ASH TRAY
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 18, 1978, Ser. No. 907,384
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—29



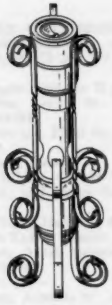
255,052
POLYFUNCTIONAL HAND-HELD HAIRDRYER
Heinz-Ulrich Haase, Kronberg, Fed. Rep. of Germany, assignor to Braun AG, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 3, 1977, Ser. No. 839,113
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 738600
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



255,053
SHAVER
Hans-Ulrich Schade, Pfuhl, Fed. Rep. of Germany, assignor to Payer-Lux Eduard Payer, Austria
Continuation-in-part of Ser. No. 733,811, Oct. 19, 1976, abandoned. This application May 10, 1978, Ser. No. 904,724
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

255,054
COMBINED LIPSTICK AND MAGNIFYING CASING THEREFOR
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Jun. 7, 1977, Ser. No. 804,412
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D28—89

255,055
LAMP
Charles Campo, 1901 S. Fifth St., Philadelphia, Pa. 19148
Filed Jun. 26, 1978, Ser. No. 919,399
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—104



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MAY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Bristol Corporation: *See*—
Stonoga, Dorothea E.; and Flint-Smith, Virginia K., 4,203,516, Cl. 206-216.000.

A. Nattermann & Cie. GmbH: *See*—
Prahl, Gertraud, 4,203,433, Cl. 128-80.00A.

Aavid Engineering, Inc.: *See*—
Johnson, Philip A.; and McCarthy, Alfred F., 4,203,488, Cl. 165-80.00B.

AB CE Johansson: *See*—
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AB Ziristor: *See*—
Pupp, Herwig; and Andersson, Birger O., 4,203,795, Cl. 156-446.000.

Abbey, William C., to Simmonds Precision Products, Inc. Surge control for centrifugal compressors. 4,203,701, Cl. 415-1.000.

Abbott Laboratories: *See*—
Genese, Joseph N., 4,203,443, Cl. 128-272.300.

Abe, Akira: *See*—
Takamizawa, Minoru; Abe, Akira; Ono, Yoshiaki; Sugimori, Yutaka; Kishibayashi, Tetsuo; and Ino, Makoto, 4,204,030, Cl. 428-447.000.

Aberle, Lothar; Bank, Walter; Hillenkamp, Franz; Kaufmann, Raimund; Nitsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, to Leybold-Heraeus GmbH. Sample analyzer. 4,204,117, Cl. 250-287.000.

Abura, Yoshinori; Toyomi, Yuritugu; and Nishino, Motohisa, to Matsushita Electric Works, Ltd. Facial treatment device. 4,203,431, Cl. 128-39.000.

Achia, Biddanda U.; and Shaw, David H., to Exxon Research & Engineering Co. Polyvinylpyrrolidone dewaxing aid for bright stocks. 4,203,824, Cl. 208-33.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed: *See*—
Blanpain, Jacques; and Delehouzee, Leon, 4,203,188, Cl. 29-420.000.

Acorn Engineering Co.: *See*—
Morris, Earl L.; Hafner, Walter V.; and Sally, Theodore J., 4,203,173, Cl. 4-427.000.

Adams, John D.: *See*—
Burnett, William C.; and Adams, John D., 4,203,535, Cl. 222-411.000.

Adhikary, Parimal K. Derivatives of imidazo[2,1-b] thiazole. 4,204,067, Cl. 548-154.000.

Adjusta-Mounts, Inc.: *See*—
Underwood, James L.; and Shapiro, Sol, 4,203,362, Cl. 101-327.000.

Adolphi, Heinrich: *See*—
Kiehs, Karl; and Adolphi, Heinrich, 4,203,977, Cl. 424-211.000.

Advanced Semiconductor Materials/America: *See*—
Terry, Malvin D., 4,204,155, Cl. 324-158.00F.

Agency of Industrial Science & Technology: *See*—
Suzuki, Hiroshi; Ito, Yukio; Yasumoto, Yosiro; Kinomura, Sigeru; and Nagashima, Kazuo, 4,203,873, Cl. 252-545.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Kataoka, Shoei; Sugiyama, Yoshinobu; and Fujisada, Hiroyuki, 4,204,132, Cl. 307-309.000.

AGFA-Gevaert, A.G.: *See*—
Blochl, Hanns; Fryda, Georg; Schlick, Erich; and Schnall, Gunther, 4,203,386, Cl. 118-653.000.
Stemme, Otto; Lermann, Peter; Schrooder, Rolf; and Karl, Horst, 4,203,662, Cl. 354-173.000.

AGFA-GEVAERT N.V.: *See*—
Claeys, Danie A.; Reyniers, Albert A.; and Janssens, Wilhelmus, 4,203,765, Cl. 430-252.000.

Agnihotri, Chaitanya B., to Stone & Webster Engineering Corporation. Process for the recovery of ethane and heavier hydrocarbon components from methane-rich gases. 4,203,742, Cl. 62-24.000.

AGRAM: *See*—
Hasquenoph, Denis, 4,203,226, Cl. 33-185.00V.

Ahlgrim, Michael; Mietens, Gerhard; Krieger, Wilfried; and Sorbe, Gunter, to Hoechst Aktiengesellschaft. Electrical power transmitting apparatus. 4,203,637, Cl. 339-5.00R.

Ahmed, Adel A. A., to RCA Corporation. Temperature-sensitive control circuits. 4,204,133, Cl. 307-310.000.

Air Products & Chemicals, Inc.: *See*—
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,204,062, Cl. 544-351.000.

Aisan Industry Co., Ltd.: *See*—
Yorioka, Keigo, 4,203,400, Cl. 123-119.00A.

Aizawa, Hiroshi: *See*—
Uchidoi, Masanori; Tsunekawa, Tokuichi; Aizawa, Hiroshi; Taguchi, Tetsuya; Ito, Tadashi; and Takishima, Yoshiyuki, 4,203,660, Cl. 354-31.000.

Akaba, Hayao: *See*—
Ii, Tadao; Tanaka, Takashi; and Akaba, Hayao, 4,203,666, Cl. 356-124.000.

Aki, Osami: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,203,899, Cl. 548-194.000.

Akimoto, Taizo: *See*—
Takahashi, Koji; Akimoto, Taizo; and Watanabe, Shigeru, 4,203,671, Cl. 356-402.000.

Akimov, Boris V.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

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deJong, Geert J., 4,203,868, Cl. 252-439.000.

Akzona Incorporated: *See*—
Drachenberg, Werner; and Wolters, Heinrich, 4,203,939, Cl. 264-130.000.
Greven, Hendrik M., 4,203,975, Cl. 424-177.000.
Hoentjen, Gerrit; de Graaf, Stephanus A. G.; Bijkerk, Albert H.; and de Jonge, Cornelis R. H. I., 4,204,060, Cl. 544-218.000.
Zengel, Hans; and Bergfeld, Manfred, 4,203,916, Cl. 260-453.00P.

Albany International Corporation: *See*—
Barthelemy, Kenneth E., 4,203,846, Cl. 210-486.000.

Aleshin, Valentin N.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

Alexander-Cooper, Inc.: *See*—
Alexander, William J., III; Cooper, John S.; and Moore, Charles E., 4,203,563, Cl. 242-66.000.

Alexander, William J., III; Cooper, John S.; and Moore, Charles E., to Alexander-Cooper, Inc. Loom take-up cloth roll doffer. 4,203,563, Cl. 242-66.000.

Alfred Walter AG: *See*—
Walter, Alfred, 4,203,320, Cl. 73-150.00R.

Algieri, Aldo A.; and Crenshaw, Ronnie R., to Bristol-Myers Company. Furan compounds. 4,203,909, Cl. 260-347.200.

Alioto, Ronald L.: *See*—
Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; Patel, Dahyabhai M.; Won, Chong M.; and Alioto, Ronald L., 4,203,985, Cl. 424-249.000.

Allen, Joseph C., to Texaco Inc. Fluid for recovering hydrocarbons. 4,203,853, Cl. 252-8.55D.

Allied Chemical Corporation: *See*—
Garner, Eugene F., 4,203,786, Cl. 149-19.910.
Mastroianni, Martin J.; and Orfeo, Sabatino R., 4,204,084, Cl. 174-25.00G.
Yeh, Chuen Y.; and Ulmer, Harry E., 4,203,923, Cl. 260-586.00P.

Aluminiumpari Tervezo es Kutato Intezet: *See*—
Kraxner, Istvan; Sebok, Antal; Steiner, Janos; and Toth, Jozsef, 4,203,689, Cl. 406-123.000.

Alvarez-Ossorio, Rafael P.: *See*—
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; and Fernandez de Gamboa, Cristina R., 4,204,063, Cl. 546-99.000.

Alza Corporation: *See*—
Michaels, Alan S., 4,203,442, Cl. 128-260.000.
Theeuwes, Felix, 4,203,439, Cl. 128-260.000.
Theeuwes, Felix, 4,203,440, Cl. 128-260.000.
Theeuwes, Felix, 4,203,441, Cl. 128-260.000.

Amedei, Giuseppe: *See*—
Rivetti, Enrico; Amedei, Giuseppe; and Bertone, Antonino, 4,203,631, Cl. 303-52.000.

Amerace Corporation: *See*—
Mayer, Robert W.; and Smorzaniuk, Adam, 4,203,385, Cl. 116-270.000.
Siebens, Larry N., 4,203,641, Cl. 339-75.00P.

American Can Company: *See*—
Meyers, George L., 4,203,355, Cl. 93-58.00R.
Vandlik, Robert P.; and Herdzina, Frank J., 4,203,314, Cl. 72-427.000.

American Cyanamid Company: *See*—
Brown, Dale G., 4,203,918, Cl. 260-465.00D.

Chang, Eugene Y. C.; and Kaizerman, Samuel, 4,203,889, Cl. 260-45.8NT.
American Home Products Corporation: *See*—
Freed, Meier E., 4,203,987, Cl. 424-250.000.
American Optical Corporation: *See*—
Persson, Staffan B., 4,203,651, Cl. 350-181.000.
American Safety Equipment Corporation: *See*—
Mattchen, Terry M., 4,203,222, Cl. 433-129.000.
American Sterilizer Company: *See*—
Gillis, John R.; and Halleck, Frank E., 4,203,943, Cl. 422-27.000.
Young, Jack H.; and Halleck, Frank E., 4,203,947, Cl. 422-114.000.
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, to Sodip SA. Hollow fiber apparatus for the fractionation of fluid especially useful as an artificial kidney. 4,203,844, Cl. 210-321.00B.
Ammeraal Nederland B.V.: *See*—
Ammeraal, Thomas C. M., 4,203,512, Cl. 198-594.000.
Ammeraal, Thomas C. M., to Ammeraal Nederland B.V. Helical conveyor. 4,203,512, Cl. 198-594.000.
AMP Incorporated: *See*—
Campari, Luigi, 4,203,333, Cl. 81-9.50A.
Desso, Jerome A.; Ritchie, Leon T.; and Yeager, Marvin L., 4,203,646, Cl. 339-205.000.
Gilissen, Hermanus P. J.; van Dijk, Petrus R. M.; and van der Sanden, Ludovicus C., 4,203,203, Cl. 29-846.000.
Anchor Hocking Corporation: *See*—
Rubbright, Harry A.; and Springer, Donald A., 4,203,486, Cl. 165-48.00R.
Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. 4-Aryl-3-butenoic acids and lower alkyl esters. 4,204,071, Cl. 560-100.000.
Andersson, Birger O.: *See*—
Pupp, Herwig; and Andersson, Birger O., 4,203,795, Cl. 156-446.000.
Andrejewski, Werner: *See*—
Dorffel, Jorg; Andrejewski, Werner; and Bartz, Wilfried, 4,204,014, Cl. 427-385.500.
Anno, Nobuo: *See*—
Tomita, Takao; Anno, Nobuo; and Yamamoto, Hitoshi, 4,203,507, Cl. 188-317.000.
Anosov, Alexei M.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.
Antonov, Alexei I.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.
Aono, Shigeo; and Hosaka, Akio, to Nissan Motor Company, Limited. Closed-loop emission control apparatus for internal combustion engine with a circuit for generating offset voltage that cancels error introduced during use. 4,203,394, Cl. 123-32.0EE.
Aradi, Emil; Blickle, Tibor; Monostori, Endre; Nemeth, Jeno; Pallai, Ivanne; and Varga, Janos, to MTA Muszaki Kemiai Kutato Intezet; and Keszthelyi Agrartudomanyi Egyetem. Contacting and drying of material in a spouted system. 4,203,228, Cl. 34-10.000.
Araki, Itiro, to Sanyo Electric Co., Ltd. Very high frequency tuner. 4,204,166, Cl. 455-289.000.
Archer, Keith: *See*—
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,203,861, Cl. 252-182.100.
Arcilesi, Donald A.; and Doty, Warren R., to Oxy Metal Industries Corporation. Method for treating polymeric substrates prior to plating employing accelerating composition containing an alkyl amine. 4,204,013, Cl. 427-304.000.
Arii, Hiroshi; Kawada, Hirohito; Yoshida, Takashi; and Nonaka, Chiaki, to Sony Corporation. Cooling assembly for cooling electrical parts wherein a heat pipe is attached to a heat conducting portion of a heat conductive block. 4,204,246, Cl. 361-385.000.
Arnett, Carroll D.; Wright, Jeremy; and Zenker, Nicolas, to Merck & Co., Inc. Reductive alkylation. 4,204,069, Cl. 548-325.000.
Aronoff, Melvin S.: *See*—
Zilbermann, Andre H.; and Aronoff, Melvin S., 4,203,485, Cl. 165-2.000.
Arrasmith, Fred V., to International Business Machines Corporation. Jam detector. 4,203,589, Cl. 271-258.000.
Artemov, Konstantin V.: *See*—
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Arthur, David M. Method of attaching a rail and a tie plate to a cross tie. 4,203,193, Cl. 29-526.00R.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Tagashira, Yoshiaki; Takagi, Hitoshi; and Inagaki, Katsumi, 4,203,835, Cl. 210-33.000.
Asahimatsu Koridofu Kabushiki Kaisha: *See*—
Kudo, Shiro; and Hayashi, Mitsuyoshi, 4,204,005, Cl. 426-518.000.
Asanagi, Etsuo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for desulfurization of exhaust gases recovering gypsum as by-product. 4,203,954, Cl. 423-243.000.
Aschwanden, Felix, to RCA Corporation. Tuning circuit with provisions for reducing pulse width jitter. 4,204,173, Cl. 331-1.00A.
ASEA Aktiebolag: *See*—
Stenkvist, Sven-Einar, 4,204,082, Cl. 13-9.00R.
Astra Pharmaceutical Products, Inc.: *See*—
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,203,972, Cl. 424-114.000.
Augenstein, Reiner: *See*—
Bruller, Eduard; Augenstein, Reiner; and Bihler, Otto, 4,203,477, Cl. 140-105.000.
Australasian Training Aids Pty. Ltd.: *See*—
Knight, Lindsay C.; and Casey, Roy E., 4,203,232, Cl. 35-25.000.
Auwarter, Wilhelm: *See*—
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, 4,203,623, Cl. 296-178.000.
Avon Industrial Polymers Limited: *See*—
Burnham, Jack; and Washbourn, Jack, 4,203,353, Cl. 92-159.000.
Babcock & Wilcox Company, The: *See*—
Edgecombe, David A., 4,203,273, Cl. 53-399.000.
Knoebel, Paul S.; and Wennerstrom, Jerald M., 4,203,391, Cl. 122-4.00D.
Bachman, David L.; and Bihuniak, Peter P., to Corning Glass Works. Ribbon burner. 4,203,553, Cl. 239-420.000.
Bachmann, Gerhard: *See*—
Dietze, Wolfgang; and Bachmann, Gerhard, 4,203,940, Cl. 264-154.000.
Back, Horst, to SKF Kugellagerfabriken GmbH. Seal and locking arrangement for a bearing assembly. 4,203,634, Cl. 308-187.200.
Bafford, Richard A.; and Mageli, Orville L., to Pennwalt Corporation. Process for di-organic peroxides. 4,204,075, Cl. 568-562.000.
Bahre, Karl; and Krohm, Reinhold, to Klokner-Werke Aktiengesellschaft. Continuous-operation crushing machine. 4,203,557, Cl. 241-186.00R.
Bailey, James E.; and Cho, Yong K., to Illinois Water Treatment Company. High loading of immobilized enzymes on activated carbon supports. 4,204,041, Cl. 435-177.000.
Bailey, Wayne; and Kemp, Robert. Radiant energy gasification apparatus. 4,203,731, Cl. 48-99.000.
Baker, Alan S., to Imperial Chemical Industries Limited. Block or graft copolymers and their use as surfactants. 4,203,877, Cl. 260-18.00R.
Baker, Don R.; and McClellan, Malcolm B., to Stauffer Chemical Co. Fungicidal use of chloro-substituted phenoxy ethers. 4,203,998, Cl. 424-283.000.
Baker, William, III; and Harris, Charles R., to Smith International, Inc. Longitudinal axis roller drill bit with gage inserts protection. 4,203,496, Cl. 175-329.000.
Bakula, Richard E.; and McCarthy, Edward C., to Harris Corporation. Video display system. 4,204,206, Cl. 340-721.000.
Bakula, Richard E.; and McCarthy, Edward C., to Harris Corporation. Video display of images with video enhancements thereto. 4,204,207, Cl. 340-723.000.
Baldwin, Gary D.; and Rampolla, Robert W., to Westinghouse Electric Corp. Slab laser assembly. 4,204,175, Cl. 331-94.50D.
Ball Corporation: *See*—
Pardee, Robert P., 4,203,856, Cl. 252-54.600.
Ballinger, Dale O., to Honeywell Inc. Solar cell. 4,203,419, Cl. 126-430.000.
Baltschun, Horst, to SMG Suddeutsche Maschinenbau-Gesellschaft mbH. Hydraulically driven press. 4,203,359, Cl. 100-209.000.
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., to Astra Pharmaceutical Products, Inc. Penicillin composition. 4,203,972, Cl. 424-114.000.
Bandag Incorporated: *See*—
Brodie, Edwin T.; and Brewer, Donaldee, 4,203,793, Cl. 156-394.000.
Bange, Joseph B.: *See*—
Hurley, Donald L.; Wessel, Francis H.; and Bange, Joseph B., 4,203,570, Cl. 251-14.000.
Bangert, Hans; and Fengler, Georg, to O & K Orenstein & Koppel Aktiengesellschaft. Rapid-change device for attachments on earth moving machines. 4,203,238, Cl. 37-118.00R.
Bank, Walter: *See*—
Aberle, Lothar; Bank, Walter; Hillenkamp, Franz; Kaufmann, Raimund; Nitsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,204,117, Cl. 250-287.000.
Barbedienne, Roger S.: *See*—
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Barcus, Lester M.; and Berry, John F. Sonic transducer mounting. 4,204,096, Cl. 179-146.00R.
Bargeman, Harry. Snare drum control mechanism. 4,203,343, Cl. 84-415.000.
Barrett, Alfred J.; and Warner, Samuel M., to United States of America, Air Force. Negative gravity swivel device. 4,203,458, Cl. 137-38.000.
Barthelemy, Kenneth E., to Albany International Corporation. Disc sector. 4,203,846, Cl. 210-486.000.
Barton, Derek H. R.; and Willis, Brian J., to Fritzsche Dodge & Olcott Inc. Process for the production of spirodienones and spirocyclic ketones. 4,203,925, Cl. 568-362.000.
Bartz, Wilfried: *See*—
Dorffel, Jorg; Andrejewski, Werner; and Bartz, Wilfried, 4,204,014, Cl. 427-385.500.
BASF Aktiengeseilschaft: *See*—
Kurtz, Walter; and Dehnert, Johannes, 4,203,894, Cl. 260-156.000.
Matthies, Paul; Kunde, Joachim; and Hoerauf, Werner, 4,204,049, Cl. 526-65.000.
Mueller, Herbert; and Huchler, Otto H., 4,203,908, Cl. 260-346.110.

Batchelor, Robert L.; and Feldman, Charles F., to Gulf Oil Corporation. Manufactured glass laminates. 4,204,029, Cl. 428-441.000.

Battelle Memorial Institute: *See—*
Schaer, Glenn R., 4,204,034, Cl. 429-54.000.

Battigelli, Jean A.; and Bouquet, Francois, to Saint-Gobain Industries. Glass fiberization by centrifugal feed of glass into attenuating blast. 4,203,745, Cl. 65-6.000.

Battigelli, Jean A.; Bouquet, Francois; Fezenko, Igor; and Massol, Jean-Jacques, to Saint-Gobain Industries. Method for centrifugal fiberization of hard glass. 4,203,746, Cl. 65-6.000.

Battigelli, Jean A.; Bouquet, Francois; and Fezenko, Igor, to Saint-Gobain Industries. Glass fiberization spinner. 4,203,748, Cl. 65-14.000.

Battigelli, Jean A.; Bouquet, Francois; and Massol, Jean-Jacques, to Saint-Gobain Industries. Glass composition and fibers. 4,203,774, Cl. 106-50.000.

Bauer, Ernest G.: *See—*
Chaffee, Robert C.; and Bauer, Ernest G., 4,203,720, Cl. 432-222.000.

Bauer, Ronald S., to Shell Oil Company. Epoxy resin traffic paint compositions. 4,203,878, Cl. 260-18.0EP.

Bauer, William V.; Isaacs, Jose A. C.; and Lamonte, Oliverio M., to Lummus Company, The. Coke desulphurization. 4,203,960, Cl. 423-461.000.

Baumann, Frederick W.; and Kaczkowski, Bernard C., to General Electric Company. Method of positioning components of a centrifugal casting machine for a mold stripping operation. 4,203,483, Cl. 164-116.000.

Baumoel, Joseph. Sonic liquid level detector. 4,203,324, Cl. 73-290.00V.

Bayer Aktiengesellschaft: *See—*
Brack, Alfred; and Kuhlthau, Hans-Peter, 4,203,722, Cl. 8-467.000.
Finke, Ulrich; Moretto, Hans-Heinrich; Niederprum, Hans; and Vorbruggen, Helmut, 4,203,914, Cl. 556-428.000.
Hohmann, Walter; Wunderlich, Klaus; and Seidler, Helmut, 4,203,885, Cl. 260-369.000.
Margotte, Dieter; and Nouvertne, Werner, 4,204,047, Cl. 525-67.000.
Meyer, Horst, 4,203,928, Cl. 568-424.000.
Wellner, Wolfgang; and Gruber, Hermann, 4,204,051, Cl. 528-55.000.

BBC Brown, Boveri & Company, Limited: *See—*
Kunzli, Roland; Melton, Keith; and Mercier, Olivier, 4,203,313, Cl. 72-364.000.

Beale, John H.; and Moss, Ernest K., to Celotex Corporation, The. Phenolic foam laminated structural panel. 4,204,020, Cl. 428-310.000.

Beatrice Foods Co.: *See—*
Schwitters, Stephen W., 4,203,461, Cl. 137-343.000.

Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., to Air Products & Chemicals, Inc. Amine salts of tertiary amino acids. 4,204,062, Cl. 544-351.000.

Becker, Gordon P., to Ferro Corporation. Article of manufacture having composite layer affording abrasion resistant and release properties. 4,204,021, Cl. 428-325.000.

Becker, Kurt; Buogert, Hermann; Schwarzer, Siegfried; and Seidel, Hans-Georg, to Hermann Heye KG. Multi-station glass-forming machine. 4,203,752, Cl. 65-163.000.

Beecham Group Limited: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,203,973, Cl. 424-114.000.

Beguin, Pierre, to Portescap. Assembly comprising a timepiece pallet anchor and its frame. 4,203,281, Cl. 368-124.000.

BEI Electronics, Inc.: *See—*
Marks, William S., 4,203,569, Cl. 244-3.230.

Bell Telephone Laboratories, Incorporated: *See—*
Fox, William M.; and Novotny, Michael A., 4,204,218, Cl. 357-55.000.
Miller, Gabriel L., 4,203,781, Cl. 148-1.500.
Thompson, Larry F., 4,203,792, Cl. 156-272.000.
Yeh, Yu Shuan, 4,204,093, Cl. 370-95.000.

Beller, W. E., to Singer Company, The. Water level control system. 4,203,462, Cl. 137-393.000.

Bellinger, Robert M.; and Gray, Michael L., to Phillips Petroleum Company. Separate feed entry to separator-contactor in gas separation. 4,203,741, Cl. 62-24.000.

Belysheva, Ninel K.: *See—*
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

Ben Sadou, Jean-Claude; and Deman, Pierre, to Thomson-CSF. Automatic gain control device for a single-sideband receiver. 4,204,172, Cl. 330-134.000.

Bencic, David M. Solar heat collector. 4,203,421, Cl. 126-444.000.

Bender, John F.: *See—*
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Bendix Corporation, The: *See—*
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Cunningham, Joseph A., 4,203,354, Cl. 92-169.000.
Hungerford, William R., 4,204,257, Cl. 364-474.000.
Kiwak, Robert S.; and Liu, Tung, 4,203,936, Cl. 264-26.000.
Sheridan, Earl A., 4,203,349, Cl. 91-47.000.

Bennett, Jack L., to General Motors Corporation. Power steering hydraulic system with a low pressure expansible reservoir. 4,203,287, Cl. 60-329.000.

Berger, Alfred H. Barrel engine with rocking ball drive. 4,203,396, Cl. 123-58.00B.

Bergeron, Gregory Bernard: *See—*
Mims, Matlock M., 4,203,437, Cl. 128-229.000.

Bergfeld, Manfred: *See—*
Zengel, Hans; and Bergfeld, Manfred, 4,203,916, Cl. 260-453.00P.

Bergner, Dieter; and Danner, Max, to Hoechst Aktiengesellschaft. Process for preparing basic aluminum chlorides. 4,203,812, Cl. 204-94.000.

Bergwerksverband GmbH: *See—*
Meckel, Joachim F.; Rohde, Wolfgang; Siebert, Werner; Wagener, Dietrich; Flockenhaus, Claus; and Galow, Manfred, 4,203,803, Cl. 201-40.000.
Wagener, Heinrich; and van Heek, Karl-Heinrich, 4,203,833, Cl. 209-139.00R.

Bernstein, Bruce S.; Kapoor, Ramesh C.; and Hyman, Seymour. Activated polymer materials and process for making same. 4,204,018, Cl. 428-246.000.

Bernstein, Lawrence A.: *See—*
Moe, Walter; Bernstein, Lawrence A.; and Heller, David, 4,203,247, Cl. 46-1.00K.

Berry, John F.: *See—*
Barcus, Lester M.; and Berry, John F., 4,204,096, Cl. 179-146.00R.

Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, to Montedison S.p.A. Self-extinguishing polymeric compositions based on modified polypropylene. 4,203,882, Cl. 260-28.50A.

Bertheussen, Harry: *See—*
Johnsson, M. K. Olof; Oberg, Karl-Erik; and Bertheussen, Harry, 4,203,763, Cl. 75-129.000.

Bertolacini, Ralph J., to Standard Oil Company (Indiana). Catalyst, method of preparation and use thereof in hydrodesulfurizing cracked naphtha. 4,203,829, Cl. 208-216.00R.

Bertone, Antonino: *See—*
Rivetti, Enrico; Amedei, Giuseppe; and Bertone, Antonino, 4,203,631, Cl. 303-52.000.

Bertotti, Giorgio: *See—*
Franco, Luigi; and Bertotti, Giorgio, 4,203,503, Cl. 181-272.000.

Berz, Wolfgang, to Gimag Aktiengesellschaft. Method and apparatus for purifying a gas of suspended particles. 4,203,736, Cl. 55-96.000.

Besenmatter, Walter, to Ing. Karl Vockenhuber; and DDr. Raimund Hauser, part interest to each. Optical system. 4,203,661, Cl. 354-53.000.

Bethlehem Steel Corporation: *See—*
Langhorst, Winfield S., 4,203,267, Cl. 52-148.000.

Betz Laboratories, Inc.: *See—*
Krysiak, William J.; and Moyer, Richard L., 4,203,556, Cl. 241-86.100.

Beyer, Nico H. H.; Huigen, Johannes H.; and van Westenbrugge, Johan K., to B.V. Neratoom. Method of sealing tube plate apertures, and repair set for use therein. 4,203,185, Cl. 29-157.30C.

Beyl, Earl L., Jr., to Traintronics, Inc. Electronic horn arrangement. 4,204,200, Cl. 340-384.00E.

Bice, Charles D.; Cooper, John H.; and Fenger, Michael L., to United States of America, Interior. Electrical cable coupler with rotatable protective covers. 4,203,640, Cl. 339-41.000.

Bihler, Otto: *See—*
Bruller, Eduard; Augenstein, Reiner; and Bihler, Otto, 4,203,477, Cl. 140-105.000.

Bihuniak, Peter P.: *See—*
Bachman, David L.; and Bihuniak, Peter P., 4,203,553, Cl. 239-420.000.

Bijkerk, Albert H.: *See—*
Hoentjen, Gerrit; de Graaf, Stephanus A. G.; Bijkerk, Albert H.; and de Jonge, Cornelis R. H. I., 4,204,060, Cl. 544-218.000.

Biot, Bernard: *See—*
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Biotronik Mess- und Therapiegerate GmbH & Co.: *See—*
Keller, John W., Jr.; Digby, Dennis; and Coombes, Alan, 4,203,447, Cl. 128-419.0PG.
Keller, John W., Jr., 4,203,448, Cl. 128-419.0PG.

Bisonaya, Rudy Y.: *See—*
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Black, Theodore W.: *See—*
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Blanpain, Jacques; and Delehouzee, Leon, to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed. Method of producing welding wire constituted by a core of welding powder enclosed by a mantle of metal. 4,203,188, Cl. 29-420.000.

Blaylock, Robert W.: *See—*
Harris, Carl R.; and Blaylock, Robert W., 4,203,497, Cl. 177-134.000.

Bledsoe, James O., Jr.; and Cardenas, Carlos G., to SCM Corporation. Hydrogenation process for the selective preparation of 3-menthene. 4,204,080, Cl. 585-273.000.

Blessing, Hubert, to Levi Strauss & Co. Gripper belt transfer. 4,203,590, Cl. 271-265.000.

Blewitt, Donald D., to Westinghouse Electric Corp. Tapered strap element for an electrical fuse. 4,204,183, Cl. 337-295.000.

Blickle, Tibor: *See*—
Aradi, Emil; Blickle, Tibor; Monostori, Endre; Nemeth, Jeno; Pallai, Ivanne; and Varga, Janos, 4,203,228, Cl. 34-10.000.

Blochl, Hanns; Fryda, Georg; Schlick, Erich; and Schnall, Gunther, to AGFA-Gevaert, A.G. Electrostatic copier with insertable developer module. 4,203,386, Cl. 118-653.000.

Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., to Polaroid Corporation. Sulfam(na)phthaleins. 4,204,061, Cl. 260-243.300.

Bodin, Ove. Hydraulic servo-brake system for electrically operated vehicles. 4,203,629, Cl. 303-10.000.

Bodnick, Sheldon; and Brice, John C., to Exxon Research & Engineering Co. Hydrodesulfurization process. 4,203,828, Cl. 208-213.000.

Bodor, Nicolae S., to Interx Research Corporation. Soft quaternary surface active agents and method of using same. 4,204,065, Cl. 546-316.000.

Boeing Company, The: *See*—
Miller, Glen E., 4,203,539, Cl. 225-2.000.
Murphy, Richard J., 4,203,204, Cl. 29-703.000.
Pinson, George T.; and Hunter, Alex B., 4,203,347, Cl. 89-1.816.

Boettger, Friedrich; Eugster, Walter; Lenssen, Walter; and Missmahl, Bodo, to Malmadie & Co. Maschinenfabrik GmbH. Punch change mechanism for a double pressure pin press. 4,203,336, Cl. 83-550.000.

Bogacki, Anthony P., to General Electric Company. Meter terminal unit for use in automatic remote meter reading and control system. 4,204,194, Cl. 340-147.0SY.

Bogacki, Anthony P., to General Electric Company. Meter terminal unit for use in automatic remote meter reading and control system. 4,204,195, Cl. 340-151.000.

Bohm, Hans-Peter. Flying saucer or throwing disk used in sports games. 4,203,249, Cl. 46-74.00D.

Boldridge, Austin G., Jr., to Conversational Systems, Inc. Removably attachable watt-hour meter monitor device. 4,204,115, Cl. 250-227.000.

Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., to Merck & Co., Inc. Pyridinyl ureas and pharmaceutical use. 4,203,988, Cl. 424-266.000.

Bolshov, Gennady V.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

Bolt, John A., to Terrapin International Limited. Shower cabinets. 4,203,171, Cl. 4-146.000.

Bonhomme, Francois R. Electric sockets for plug and socket connectors and methods for their manufacture. 4,203,647, Cl. 339-256.00R.

Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., to Dyonics, Inc. Surgical instrument suitable for closed surgery such as of the knee. 4,203,444, Cl. 128-276.000.

Borglum, Keith B. Rudder assembly. 4,203,380, Cl. 114-144.00R.

Borkowski, Donald F., to Bendix Corporation, The. Wheel cylinder attachment. 4,203,508, Cl. 188-325.000.

Borror, Alan L.: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,204,061, Cl. 260-243.300.

Boschung, Marcel, to Marcel Boschung, Firma. Controlling mechanism for sprinkler system. 4,203,459, Cl. 137-119.000.

Boss, Gary R., to Erie Manufacturing Company. Reversible motor operated valve with spring assist. 4,203,573, Cl. 251-133.000.

Bottum, Edward W. Solar heating system and component. 4,203,422, Cl. 126-417.000.

Boulais, Richard A., to Laser Systems, Inc. Aerial surveying method to determine ground contours. 4,203,665, Cl. 356-4.000.

Bouquet, Francois: *See*—
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Battigelli, Jean A.; Bouquet, Francois; Fezenko, Igor; and Massol, Jean-Jacques, 4,203,746, Cl. 65-6.000.
Battigelli, Jean A.; Bouquet, Francois; and Fezenko, Igor, 4,203,748, Cl. 65-14.000.
Battigelli, Jean A.; Bouquet, Francois; and Massol, Jean-Jacques, 4,203,774, Cl. 106-50.000.

Bourgeois, Gerard J.; Gaudiana, Russell A.; and Sahatjian, Ronald A., to Polaroid Corporation. Photographic products comprising dye developers and N-oxides. 4,203,766, Cl. 430-243.000.

Bowler, Jean; and Robinson, Graham E., to Imperial Chemical Industries Limited. Prostane derivatives. 4,204,001, Cl. 424-308.000.

Bowman, Harold M. Manhole construction. 4,203,686, Cl. 404-25.000.

Bowman, Miles A., Jr., to Dana Corporation. Vehicle load supporting structure. 4,203,617, Cl. 280-797.000.

Boyadjieff, George I.; and Gill, Jerry A., to Varco International, Inc. Slip assembly. 4,203,182, Cl. 24-263.00D.

Boyd, Donald A., to Cardinal American Corporation. Fireplace heater and grate. 4,203,417, Cl. 126-165.000.

Bozhenov, Jury F.: *See*—
Ivanov, Jury N.; Artemov, Konstantin V.; Suris, Leonid I.; and Bozhenov, Jury F., 4,203,372, Cl. 410-67.000.

Brack, Alfred; and Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Transfer printing process with naphtholactam dyes. 4,203,722, Cl. 8-467.000.

Braeger, Horst K. H., to Nordischer Maschinenbau Rud. Baader GmbH & Co KG. Machine for skinning fish or fish fillets. 4,203,179, Cl. 17-62.000.

Braly, Henry L. Illuminated weather vane. 4,204,271, Cl. 362-145.000.

Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; and Fernandez de Gamboa, Cristina R., to Laboratorios Made, S.A. N(Aminoalkyl)-naphthalimides and their derivatives. 4,204,063, Cl. 546-99.000.

Brandt, Cary. Oil burner arrangement for heating installations. 4,203,719, Cl. 431-352.000.

Brandt, Gerald B.: *See*—
Gottlieb, Milton; and Brandt, Gerald B., 4,203,326, Cl. 73-339.00R.

Brazelton, Carl L., to Stran Corporation. Aquatic exercise facility with island. 4,203,390, Cl. 119-29.000.

Brennen, Michael B.: *See*—
Gyugyi, Laszlo; and Brennen, Michael B., 4,204,151, Cl. 323-119.000.

Bressler, Wilbur L.; Lowery, Kirby, Jr.; and Vance, Fred L., Jr., to Dow Chemical Company, The. Polymerization of α-olefins with a dual transition metal catalyst. 4,204,050, Cl. 526-97.000.

Brewbaker, James L.; and Marzett, Rodrique L., to Dow Chemical Company, The. Halopolymers crosslinked with a 1,3-diaminopropane. 4,204,048, Cl. 525-343.000.

Brewer, Donaldee: *See*—
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Brice, John C.: *See*—
Bodnick, Sheldon; and Brice, John C., 4,203,828, Cl. 208-213.000.

Brieger, Emmet F. High pressure, fluid tight seal. 4,203,607, Cl. 277-188.00A.

Bristol-Myers Company: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,203,909, Cl. 260-347.200.

Bristol Products, Inc.: *See*—
Colten, Jerrold L., 4,204,106, Cl. 219-213.000.

British Petroleum Company Limited, The: *See*—
Hancock, Ronald D.; and Howell, Ian V., 4,203,952, Cl. 423-6.000.

Broall, Richard: *See*—
Wirtz, Peter; and Broall, Richard, 4,203,850, Cl. 252-8.050.

Brocklehurst, Charles E.; and Burton, Perry E., to Opelika Manufacturing Corp. Sheet inspection and marking system. 4,204,012, Cl. 427-288.000.

Brodie, Edwin T.; and Brewer, Donaldee, to Bandag Incorporated. Pressure vessel system for retreading tires. 4,203,793, Cl. 156-394.000.

Bromberg, Nathan S. System and method of fluorescence polarimetry. 4,203,670, Cl. 356-367.000.

Brooker, Bernard F. Ball and method for making it. 4,203,941, Cl. 264-250.000.

Brooks, Lula M. Timing assembly for oxygen respiration units. 4,203,434, Cl. 128-205.240.

Broomfield, Junior: *See*—
Wolter, Karl E.; Peters, William J.; Roberts, Donald R.; McReynolds, Robert D.; Broomfield, Junior; and Crews, Ernest R., 4,203,253, Cl. 47-10.000.

Brouwer, Egbert K. Filter press. 4,203,845, Cl. 210-386.000.

Brown, Alvin E.; and Van Over, William E., to Du Pont de Nemours, E. I., and Company. Apparatus for the ultrasonic measurement of the flow velocity of fluent media. 4,203,322, Cl. 73-194.00A.

Brown Company: *See*—
Cortigene, Louis R.; and Wright, Robert G., 4,203,388, Cl. 119-1.000.

Brown, Dale G., to American Cyanamid Company. Halo-substituted benzospiro cyclopropane carboxylates as insecticides and ixodicides. 4,203,918, Cl. 260-465.00D.

Brown, Harry A., Jr.; and Durgin, Robert F., to United States of America, Army. Stable aqueous foam formulation, and method of use thereof for visual obscuration and area denial. 4,203,974, Cl. 424-166.000.

Brown, Kenneth L., to Rockwell International Corporation. Signal converter using a quad diode race. 4,204,168, Cl. 455-330.000.

Brown, Michael J., to GAF Corporation. Phosphoryl hydrazines. 4,203,932, Cl. 260-923.000.

Brown, Michael J., to GAF Corporation. Insecticidal 1-sec. and tert.-alkyl-2-disubstituted-phosphoryl hydrazines. 4,203,979, Cl. 424-220.000.

Brown, Stephen D. Target with removable score sheet. 4,203,600, Cl. 273-407.000.

Brown, William E., to Dow Chemical Company, The. Method of determining the open circuit voltage of a battery in a closed circuit. 4,204,153, Cl. 324-429.000.

Bruchez, Raymond J.: *See*—
Hanloser, Kurt J.; Bruchez, Raymond J.; and Gill, James T., Jr., 4,203,285, Cl. 60-261.000.

Brudevold, Finn. Interconnection unit for multiple data processing systems. 4,204.251, Cl. 364-200.000.

Bruller, Eduard; Augenstein, Reiner; and Bihler, Otto, to Otto Bihler Maschinenfabrik GmbH & Co. KG. Material working machine mounting tools in several planes. 4,203,477, Cl. 140-105.000.

Brundbjerg, Niels. Air purifier of the regenerating type. 4,203,948, Cl. 422-121.000.

Bruney, Paul F. Audio image recovery system. 4,204,092, Cl. 179-1.00G.

Brunswick Corporation: *See*—
Puryear, John W., 4,203,565, Cl. 242-84.10R.

Bryant, Cal L.: *See*—
Wynn, Edward J.; and Bryant, Cal L., 4,203,695, Cl. 414-40.000.

Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., to Caterpillar Tractor Co. Controls for combined hydrostatic and multiple speed range transmission units with automatic speed control and braking functions. 4,203,293, Cl. 60-490.000.

Buchanan, Thomas M., to United States of America, America. Neisseria gonorrhoeae vaccine. 4,203,971, Cl. 424-92.000.

Buchholz, Jeffrey C., to General Motors Corporation. On-board detection of antiknock compounds in automotive gasoline. 4,203,807, Cl. 204-1.00T.

Buchwald, Holger: *See*—
Krull, Manfred; Buchwald, Holger; and Kirsch, Wilhelm, 4,203,435, Cl. 128-156.000.

Buckson, Gerald L., to Du Pont de Nemours, E. I., and Company. Method and apparatus for optically inspecting cylindrical articles. 4,203,673, Cl. 356-446.000.

Bud Antle, Inc.: *See*—
Cayton, David W., 4,203,697, Cl. 414-345.000.

Budal, Kjell; and Falnes, Johannes. System for the conversion of sea wave energy. 4,203,294, Cl. 60-497.000.

Bugaut, Andree; and Laudon, Monique, to L'Oreal. Diaminobenzoquinones. 4,204,059, Cl. 544-166.000.

Buhrer, Erwin. Foundry molding machine for the production of mold halves in mold boxes. 4,203,484, Cl. 164-227.000.

Buken, Gunther; and Lang, Raimund. Process and apparatus for measuring the length of moving shaped articles particularly red-hot semifinished articles. 4,204,224, Cl. 358-107.000.

Bull, David W., to Nartron Corporation. Electrical switch. 4,204,102, Cl. 200-153.00J.

Bulten-Kanthal AB: *See*—
Thorssell, Olof L., 4,203,323, Cl. 73-194.00E.

Bunker Ramo Corporation: *See*—
Fukushima, Hiroyuki; Yoshida, Minoru; and Inoue, Hiromasa, 4,203,196, Cl. 29-566.300.
Krolak, Ronald F.; and Warywoda, Joseph, 4,203,643, Cl. 339-107.000.

Buogert, Hermann: *See*—
Becker, Kurt; Buogert, Hermann; Schwarzer, Siegfried; and Seidel, Hans-Georg, 4,203,752, Cl. 65-163.000.

Burckardt, Dieter, to Zahnradfabrik Friedrichshafen, AG. Steering valve for hydrostatic drive. 4,203,290, Cl. 60-420.000.

Burkhardt, Jurgen; and Wegehaupt, Karl-Heinrich, to Wacker-Chemie GmbH. Stabilization of organopolysiloxanes. 4,203,913, Cl. 556-401.000.

Burnett, Edward L.; and Stack, Eugene V., to Dow Chemical Company, The. Manufacture of polytetrafluoroethylene tubes. 4,203,938, Cl. 264-127.000.

Burnett, William C.; and Adams, John D., to Burnett, William C. Method and apparatus for low-dust discharge of particulate material through a nozzle. 4,203,535, Cl. 222-411.000.

Burnham, Bradshaw; and Nichols, Charles F., to United States of America, Navy. Jammer apprehending amplifier for proximity fuzes. 4,203,365, Cl. 102-214.000.

Burnham, Jack; and Washbourn, Jack, to Avon Industrial Polymers Limited; and Westinghouse Brake & Signal Co. Ltd. Piston means for piston-cylinder arrangements. 4,203,353, Cl. 92-159.000.

Burns-Biotec Laboratories, Inc.: *See*—
Harris, Delbert L.; Goodnow, Robert A.; Glock, Robert D.; and Kinyon, Joann M., 4,203,968, Cl. 424-92.000.

Burroughs Wellcome Co.: *See*—
Caldwell, Albert G.; and Whittaker, Norman, 4,204,068, Cl. 548-313.000.
Telling, Ronald C.; Passingham, Roy J.; Kitchener, Brian L.; and Hopkinson, David G., 4,203,801, Cl. 435-284.000.

Burton, Perry E.: *See*—
Brocklehurst, Charles E.; and Burton, Perry E., 4,204,012, Cl. 427-288.000.

Bushev, Alexandr V.: *See*—
Ermakov, Vladimir E.; Makarov, Viktor B.; Seidaliev, Fikrat S. O.; Nikiforov, Alexandr M.; Bushev, Alexandr V.; and Dozortsev, July K., 4,203,309, Cl. 72-96.000.

Butruille, Yves: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,203,844, Cl. 210-321.00B.

Butterworth, Dennis: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,203,973, Cl. 424-114.000.

Buxmann, Kurt, to Swiss Aluminium Ltd. Static mixer for the production of metal alloys. 4,203,580, Cl. 266-216.000.

B.V. Neratoom: *See*—
Beyer, Nico H. H.; Huigen, Johannes H.; and van Westenbrugge, Johan K., 4,203,185, Cl. 29-157.30C.

Bye, Ashley D., to Imperial Chemical Industries Limited. Transition metal composition and production thereof. 4,203,867, Cl. 252-429.00B.

Byrd, Erwin S., Jr. Liquid-cooled smoking device. 4,203,455, Cl. 131-173.000.

Cagle, David G. Soccer court. 4,203,594, Cl. 273-411.000.

Cal-Wood Door: *See*—
Naslund, Edwin N.; and MacDonald, Ian, 4,203,255, Cl. 49-399.000.

Caldwell, Albert G.; and Whittaker, Norman, to Burroughs Wellcome Co. Nitrogen heterocycles. 4,204,068, Cl. 548-313.000.

Cam Gears Limited: *See*—
Rogers, Peter R., 4,203,683, Cl. 403-132.000.

Campari, Luigi, to AMP Incorporated. Coaxial cable stripping device. 4,203,333, Cl. 81-9.50A.

Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., III, to Monsanto Company. Electroplating cathodes for electrochemical synthesis. 4,203,808, Cl. 204-23.000.

Canon Kabushiki Kaisha: *See*—
Hanada, Hiroshi, 4,203,652, Cl. 350-182.000.
Kishi, Hirotoshi; Hattori, Hiroyuki; and Shimizu, Katsuichi, 4,203,587, Cl. 271-293.000.
Tosaka, Umi; Kondo, Hideyo; Murai, Keiichi; and Toma, Hitoshi, 4,203,764, Cl. 430-67.000.
Uchidoi, Masanori; Tsunekawa, Tokuichi; Aizawa, Hiroshi; Taguchi, Tetsuya; Ito, Tadashi; and Takishima, Yoshiyuki, 4,203,660, Cl. 354-31.000.

Canron Corp.: *See*—
Stewart, John K.; and von Beckmann, Helmuth, 4,203,367, Cl. 104-7.00B.

Canup, Robert E., to Texaco Inc. Distributorless ignition method and system for a multicylinder internal combustion engine. 4,203,404, Cl. 123-148.0ND.

Cardenas, Carlos G.: *See*—
Bledsoe, James O., Jr.; and Cardenas, Carlos G., 4,204,080, Cl. 585-273.000.

Cardi, Paul. Pressure equalizing valve. 4,203,467, Cl. 137-557.000.

Cardinal American Corporation: *See*—
Boyd, Donald A., 4,203,417, Cl. 126-165.000.

Carl Freudenberg, Firma: *See*—
Krull, Manfred; Buchwald, Holger; and Kirsch, Wilhelm, 4,203,435, Cl. 128-156.000.

Carl Robert Eckelmann AG: *See*—
Janning, Jorg; Kaminsky, Walter; Sinn, Hansjorg; and Tysarcyk, Stanislav, 4,203,804, Cl. 202-121.000.

Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., to Merck & Co., Inc. Swine atropic rhinitis vaccine. 4,203,970, Cl. 424-92.000.

Carlstedt, Bo R., to Ingenjorsfirman Orrje & Co AB. Coalescence system. 4,203,843, Cl. 210-262.000.

Carpaneti, Edoardo: *See*—
Vargiu, Silvio; Carpaneti, Edoardo; and Passalenti, Beppino, 4,203,816, Cl. 204-159.160.

Carpaneto, Tomaso: *See*—
Facco, Giuseppe; and Carpaneto, Tomaso, 4,203,717, Cl. 431-182.000.

Carr, Norman L.; Schleppy, Ronald, Jr.; Schmid, Bruce K.; and Shah, Yatish T., to Gulf Research & Development Company. Combined coal liquefaction-gasification process. 4,203,823, Cl. 208-10.000.

Carr, Norman L.; and McGinnis, Edgar L., to Gulf Research & Development Company. Process for separating solids from coal liquids. 4,203,839, Cl. 210-71.000.

Carter, Tommie B.: *See*—
Hallack, Richard D.; and Carter, Tommie B., 4,203,836, Cl. 210-42.00R.

Carter, Woodward C., II, to Westinghouse Electric Corp. Load regulation as part of an adaptive priority determination power demand control system. 4,204,127, Cl. 307-39.000.

Casey, Roy E.: *See*—
Knight, Lindsay C.; and Casey, Roy E., 4,203,232, Cl. 35-25.000.

Cassella Aktiengesellschaft: *See*—
Muller, Rolf; and Ribka, Joachim, 4,204,056, Cl. 542-416.000.

Casutt, Toni: *See*—
Minery, Aime, 4,203,272, Cl. 53-374.000.

Caterpillar Tractor Co.: *See*—
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,203,293, Cl. 60-490.000.
Miller, Robert G., 4,203,375, Cl. 74-335.000.

Cavelos, Arthur A., to General Electric Company. Controllable saturation sidelobe canceller. 4,204,211, Cl. 343-100.0LE.

Cayton, David W., to Bud Antle, Inc. Transfer apparatus for palletized loads. 4,203,697, Cl. 414-345.000.

CBS Inc.: *See*—
Malek, Jack H.; and Siegel, Herman M., 4,203,251, Cl. 46-107.000.

Ceagfilter und Entstaubungstechnik GmbH: *See*—
Winter, Karl; and Staschik, Guunter, 4,203,734, Cl. 55-26.000.

Celotex Corporation, The: *See*—
Beale, John H.; and Moss, Ernest K., 4,204,020, Cl. 428-310.000.

Central Glass Company, Limited: *See*—
Enomoto, Takamitsu; Tanaka, Kyoji; Kawamoto, Hiromi; Mizuno, Tamotsu; and Fujinaga, Masao, 4,203,955, Cl. 423-308.000.

Centre de Recherches Metallurgiques: *See*—
Economopoulos, Marios; and Respen, Yves J., 4,203,783, Cl. 148-12.400.

Centre National d'Etudes Spatiales: *See*—
Riboulet, Michel J.; and Segui, Gerard R., 4,204,120, Cl. 250-341.000.

Centre Technique des Industries Mechaniques: *See*—
Vieu, Alain; and Flambard, Christian, 4,203,315, Cl. 73-1.00R.

Centro Richerche Fiat S.p.A.: *See*—
Franco, Luigi; and Bertotti, Giorgio, 4,203,503, Cl. 181-272.000.
Rivetti, Enrico; Amedei, Giuseppe; and Bertone, Antonino, 4,203,631, Cl. 303-52.000.

Cepelinski, Jacob, to Mitel Corporation. Tone applying line circuit. 4,204,094, Cl. 179-18.0FA.

Chaffee, Robert C.; and Bauer, Ernest G., to Gilmore & Tatge Mfg. Co. Oil burner. 4,203,720, Cl. 432-222.000.

Chakrabarti, Paritosh M., to GAF Corporation. Phosphate-free machine dishwashing composition. 4,203,858, Cl. 252-135.000.

Chamberlain, Albert E.: *See*—
Gall, John C.; Ozimek, Chester E.; and Chamberlain, Albert E., 4,203,681, Cl. 400-697.000.

Champion International Corporation: *See*—
Southworth, Ronald W., 4,203,229, Cl. 34-46.000.

Chang, Eugene Y. C.; and Kaizerman, Samuel, to American Cyanamid Company. Polyurethane compositions stabilized with ketoximes. 4,203,889, Cl. 260-45.8NT.

Chapman, Darwin E., to Creative Phototronics, Inc. Digital exposure meter. 4,203,668, Cl. 356-215.000.

Chapman, Frank X.; Gallant, Charles R.; and Stull, Charles V., to Gould Inc. Seismic-proof bus duct joint. 4,204,085, Cl. 174-86.000.

Chapuis, Henri: *See*—
Lequeux, Christian; and Chapuis, Henri, 4,203,474, Cl. 138-96.00R.

Chase, John D.: *See*—
Woods, Hanbury J.; Chase, John D.; and Galvez, Buenaventura B., 4,204,077, Cl. 568-697.000.

Chavannes, Marc A. Method of forming wire reinforced corrugated board. 4,203,790, Cl. 156-179.000.

Chavannes, Marc A. Reinforced paper products. 4,204,016, Cl. 428-108.000.

Chelle, Rene, to Societe Anonyme S.E.T.R.I.C. Method of gasifying and agitating a fermentation culture. 4,204,042, Cl. 435-253.000.

Chemische Werke Huels, AG: *See*—
Dorffel, Jorg; Andrejewski, Werner; and Bartz, Wilfried, 4,204,014, Cl. 427-385.500.

Chen, Tsang J., to Eastman Kodak Company. Photographic elements having hydrophilic colloid layers containing hydrophobic addenda uniformly loaded in latex polymer particles. 4,203,716, Cl. 430-207.000.

Cheng, Richard C. M. Model track section. 4,203,548, Cl. 238-10.00F.

Chevron Research Company: *See*—
Reynolds, Richard N., Jr., 4,203,904, Cl. 260-343.600.

Chiang, Chwan K.: *See*—
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Gau, Shek-Chung, 4,204,216, Cl. 357-8.000.

Chiba, Norio: *See*—
Noda, Yoichiro; Matsumura, Michio; Chiba, Norio; and Hata, Masahito, 4,203,815, Cl. 204-159.200.

Chirash, William: *See*—
Johnson, James R.; and Chirash, William, 4,203,852, Cl. 252-8.800.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Asanagi, Etsuo, 4,203,954, Cl. 423-243.000.

Cho, Yong K.: *See*—
Bailey, James E.; and Cho, Yong K., 4,204,041, Cl. 435-177.000.

Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, to Institute Francais du Petrole. Device for emitting acoustic waves in a liquid medium. 4,203,501, Cl. 181-120.000.

Ciba-Geigy Corporation: *See*—
Hubele, Adolf, 4,204,002, Cl. 424-309.000.
Ramey, Chester E.; and Luzzi, John L., 4,203,890, Cl. 260-45.80N.
Sturm, Elmar, 4,203,978, Cl. 424-211.000.

Cislo, Casimer J.; and Cummings, Seth B., Jr., to General Motors Corporation. Automotive vehicle suspension. 4,203,615, Cl. 280-689.000.

Claeys, Danie A.; Reyniers, Albert A.; and Janssens, Wilhelmus, to AGFA-GEVAERT N.V. Etch bleaching liquid with iron(III)ions. 4,203,765, Cl. 430-252.000.

Clairol Incorporated: *See*—
Kunz, Raymond W., 4,203,230, Cl. 34-99.000.

Clamp, Frank: *See*—
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,203,861, Cl. 252-182.100.

Clark, Dana A. Inflatable solar collector. 4,203,425, Cl. 126-426.000.

Clear, Theodore E. Methods for manufacturing cementitious reinforced panels. 4,203,788, Cl. 156-44.000.

Cleary, James J.; and Cleary, John M. Electronic controlled-duration switching. 4,204,149, Cl. 323-24.000.

Cleary, John M.: *See*—
Cleary, James J.; and Cleary, John M., 4,204,149, Cl. 323-24.000.

Clifton, Jerry L.; Gentile, Ralph; Hurlbut, Russell G.; and King, James L., to Eastman Kodak Company. Film positioning apparatus. 4,203,664, Cl. 355-64.000.

Clinton Electronics Corporation: *See*—
Permenter, Marvin M., 4,204,231, Cl. 358-247.000.

Coburn Optical Industries, Inc.: *See*—
Haddock, Fred, 4,203,259, Cl. 51-97.0NC.

Coffey, Rufus G., to Rheem Manufacturing Company. Device to feed a ribbon of sausage support loops into clip attachment apparatus. 4,203,335, Cl. 83-232.000.

Coffman Manufacturing Corp.: *See*—
Coffman, Ronald D., 4,203,572, Cl. 251-95.000.

Coffman, Ronald D., to Coffman Manufacturing Corp. Locking ball valve. 4,203,572, Cl. 251-95.000.

Coggin, Charles H., Jr.; and Sakakura, Tatsuo R., to Nitto Boseki Co., Ltd. Precision winder for the drawing and packaging of synthetic fibers. 4,203,559, Cl. 242-18.00G.

Cohen, David B. Efficiency of human learning employing the electroencephalograph and a long-term learning diagnostic-remedial process. 4,203,452, Cl. 128-732.000.

Cohen, Frederic S.; and Hyland, Albert L., to Polaroid Corporation. Multiple duty battery. 4,204,036, Cl. 429-152.000.

Cohen, Sheppard: *See*—
Shimer, Robert M.; Dombrowski, Joseph A.; and Cohen, Sheppard, 4,204,139, Cl. 315-58.000.

Cole, Martin; Hood, John D.; and Butterworth, Dennis, to Beecham Group Limited. Antibiotics. 4,203,973, Cl. 424-114.000.

Coleman, Randolph D., to United States of America, Navy. Pulse width modulated power amplifier for direct current motor control. 4,204,143, Cl. 318-341.000.

Colgate-Palmolive Company: *See*—
Dugan, Bernard B., 4,203,857, Cl. 252-92.000.
Johnson, James R.; and Chirash, William, 4,203,852, Cl. 252-8.800.
Ramachandran, Pallassana N., 4,203,851, Cl. 252-8.600.

Collin, Andre: *See*—
Collin, Maurice; Lapointe, Michel; and Collin, Andre, 4,203,345, Cl. 84-478.000.

Collin, Maurice; Lapointe, Michel; and Collin, Andre. Automatic visual teaching device for the learning of music or component parts thereof. 4,203,345, Cl. 84-478.000.

Collins, Marcus H.; and Smith, John K., to Eaton Corporation. Variable width tire building drum with interdigitated shoes. 4,203,794, Cl. 156-415.000.

Collins, Walter W., to Jenkins Metal Corporation. Simulated belt buckle and appendage. 4,203,167, Cl. 2-322.000.

Colombo, Paolo; and Radici, Pierino, to Societa Italiana Resine S.I.R. S.p.A. Process for purifying gaseous formaldehyde. 4,203,735, Cl. 55-26.000.

Colten, Jerrold L., to Bristol Products, Inc. Electrical heating system for building structures. 4,204,106, Cl. 219-213.000.

Compagnie Industrielle de Mecanismes: *See*—
Noel, Jean P.; and Party, Marcel, 4,203,621, Cl. 292-216.000.

Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., to Instructo/McGraw-Hill, Inc. Transparency storage and display apparatus. 4,203,659, Cl. 353-120.000.

Contamoil Corporation: *See*—
Snowden, James E., Jr.; and Snowden, Esther A., 4,203,725, Cl. 23-230.0HC.

Conti, Rino, to Dart Industries Inc. Shelf display system. 4,203,373, Cl. 108-152.000.

Continental Group, Inc., The: *See*—
Hasegawa, Gary K., 4,203,528, Cl. 220-269.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Peter, Julius; Johannsen, Peter; and Mauk, Gerhard, 4,203,480, Cl. 152-209.0NT.

Conversational Systems, Inc.: *See*—
Boldridge, Austin G., Jr., 4,204,115, Cl. 250-227.000.

Cook, Kenneth J.: *See*—
Ruszala, Frederick B.; and Cook, Kenneth J., 4,204,261, Cl. 364-607.000.

Cook, Sanford L.; Molisani, Justin J.; and Dennison, Kenneth I., Jr., to Standard Keil Hardware Manufacturing Company, a Division of Buildex Incorporated. Safety latch. 4,203,622, Cl. 292-221.000.

Cooke, Horise M.: *See*—
Vyse, Gerrard N.; and Cooke, Horise M., 4,203,321, Cl. 73-168.000.

Cookson, Richard C.; Schulte-Elte, Karl-Heinrich; and Hauser, Arnold, to Firmenich, S.A. Process for preparing a furanic compound. 4,203,907, Cl. 260-346.110.

Coombes, Alan: *See*—
Keller, John W., Jr.; Digby, Dennis; and Coombes, Alan, 4,203,447, Cl. 128-419.0PG.

Cooper, John H.: *See*—
Bice, Charles D.; Cooper, John H.; and Fenger, Michael L., 4,203,640, Cl. 339-41.000.

Cooper, John S.: *See*—
Alexander, William J., III; Cooper, John S.; and Moore, Charles E., 4,203,563, Cl. 242-66.000.

Cooper, Robin D. G.: *See*—
Koppel, Gary A.; and Cooper, Robin D. G., 4,203,896, Cl. 260-239.00A.

Cope, Steven A., to Du Pont de Nemours, E. I., and Company. Electrolytic cell with flow detection means. 4,203,819, Cl. 204-247.000.

Coppelman, Marcy. Work table for occupational therapy. 4,203,593, Cl. 272-117.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic compositions of polynorbornene and polyolefin resin. 4,203,884, Cl. 260-33.6AQ.

Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, to Snamprogetti, S.p.A. Chemical compositions based on titanium trihalides and methods for their production and use. 4,203,866, Cl. 252-429.00C.

Corbett, Clifford F., to Foseco International Limited. Calculating apparatus. 4,203,542, Cl. 235-85.00R.

Corey, Kenneth J., to Lewis, Donald J. Method for lining a flange face for lined pipe and product of method. 4,203,475, Cl. 138-109.000.

Corning Glass Works: *See*—
Bachman, David L.; and Bihuniak, Peter P., 4,203,553, Cl. 239-420.000.
Davis, Allen D., Jr.; Johns, Herbert L.; and Lachman, Irwin M., 4,203,772, Cl. 106-40.00R.
Schultz, Peter C.; and Wusirika, Raja R., 4,203,744, Cl. 65-3.00A.
Shay, George C., 4,203,750, Cl. 65-99.00A.
Simon, Raphael A., 4,204,027, Cl. 428-428.000.

Corsetti, Sheryll L. Adjusting tool for air delivery register. 4,203,332, Cl. 81-3.00R.

Cortigene, Louis R.; and Wright, Robert G., to Brown Company. Animal litter and process. 4,203,388, Cl. 119-1.000.

Cosden Technology, Inc.: *See*—
Mayes, Warden W., 4,203,826, Cl. 208-64.000.

Cowles, Arthur L.; and Ensign, Thomas C., to Minnesota Mining and Manufacturing Company. Liquid level sensing apparatus. 4,203,325, Cl. 73-304.00R.

Cowley, Gerald, to Erco Industries Limited. Chlorine dioxide generation process. 4,203,961, Cl. 423-478.000.

Coxon, DeWayne; and Gates, Timothy P., to Jordan College. Solar heat air system. 4,203,424, Cl. 126-422.000.

CPS, Inc.: *See*—
Wigley, Patrick A., 4,204,247, Cl. 361-387.000.

Cragoe, Edward J., Jr.: *See*—
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,203,988, Cl. 424-266.000.

Cramer, Jurgen, to Hoechst Aktiengesellschaft. Process for the manufacture of p-benzoquinone-diketals. 4,203,811, Cl. 204-78.000.

Cramer, Jurgen; and Lindner, Werner, to Hoechst Aktiengesellschaft. Apparatus for carrying out electrochemical reactions and correspondingly suitable bipolar electrodes. 4,203,821, Cl. 204-268.000.

Crandell, Walter R., to Fast Heat Element Mfg. Co., Inc. Method for making a ceramic bond heater. 4,203,197, Cl. 29-611.000.

Crane, Charles J. Calf-tying practice dummy. 4,203,233, Cl. 35-29.00R.

Cranfield, Peter J., to National Research Development Corporation. Triazines and their use in bonding resins to biological tissue. 4,203,220, Cl. 433-228.000.

Creasy, Stephen L.: *See*—
Wheeler, Myron S.; and Creasy, Stephen L., 4,204,213, Cl. 343-706.000.

Creative Phototronics, Inc.: *See*—
Chapman, Darwin E., 4,203,668, Cl. 356-215.000.

Cremer, Heinz P., to Keiper Automobiltechnik GmbH & Co KG. Apparatus for adjusting a vehicle seat. 4,204,255, Cl. 364-425.000.

Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,203,909, Cl. 260-347.200.

Cresswell, Michael W.; and Fiedor, Richard J., to Westinghouse Electric Corp. Light activated switch system having high di/dt capability. 4,204,116, Cl. 250-229.000.

Crews, Ernest R.: *See*—
Wolter, Karl E.; Peters, William J.; Roberts, Donald R.; McReynolds, Robert D.; Broomfield, Junior; and Crews, Ernest R., 4,203,253, Cl. 47-10.000.

Cromas, Joseph C.; and Green, Thomas P., to Bendix Corporation, The. Closed-loop idle speed control system for fuel-injected engines using pulse width modulation. 4,203,395, Cl. 123-32.0EA.

Crosby, Guy A.: *See*—
Wang, Patricia C.; Wingard, Robert E., Jr.; and Crosby, Guy A., 4,204,007, Cl. 426-548.000.

Crownover, Frederick S. Glove and tool device with two tool elements. 4,203,495, Cl. 172-370.000.

Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., to Monsanto Company. Copolymers of acetal carboxylates. 4,204,052, Cl. 525-398.000.

Cryer, Edward, to Lucas Industries Limited. Electrical switch. 4,204,099, Cl. 200-4.000.

Csizy, Tibor; Karpat, Arpad; Melis, Janos; and Szemerey, Zoltan, to Villamos Berendezes es Keszuvek Muvek. Fuse-element for electric fuses. 4,204,184, Cl. 337-295.000.

Cullinan, George J.; and Gerzon, Koert, to Eli Lilly and Company. Amide derivatives of VLB, leurosidine, leurocristine and related dimeric alkaloids. 4,203,898, Cl. 260-244.400.

Cummings, Seth B., Jr.: *See*—
Cislo, Casimer J.; and Cummings, Seth B., Jr., 4,203,615, Cl. 280-689.000.

Cunningham, Joseph A., to Bendix Corporation, The. Hydraulic piston with metallic O-ring groove and non-metallic slidable surfaces. 4,203,354, Cl. 92-169.000.

Current, Wayne A., to Singer Company, The. Package for sewing machine needles. 4,203,518, Cl. 206-380.000.

Cytologiska Centrallaboratoriet AB: *See*—
Stormby, Nils G., 4,203,797, Cl. 156-521.000.

Dal Pont, Giorgio. Endosseal implant for dental prosthesis. 4,203,218, Cl. 433-176.000.

Dale, Gerald, to Medeci Developments Limited. Urine collection device. 4,203,169, Cl. 4-144.100.

Dana Corporation: *See*—
Bowman, Miles A., Jr., 4,203,617, Cl. 280-797.000.

Daniels, Travis J. Lighting system for bicycles. 4,204,191, Cl. 340-134.000.

Danielsson, Dan G.: *See*—
Kjellander, Jan O.; and Danielsson, Dan G., 4,204,045, Cl. 435-301.000.

Danner, Max: *See*—
Bergner, Dieter; and Danner, Max, 4,203,812, Cl. 204-94.000.

Dansereau, John L., to Federal-Mogul Corporation. Process for separating and recovering aluminum and steel from bimetal scrap. 4,203,762, Cl. 75-68.00R.

Darrow, Burr: *See*—
Zemek, Albert W.; Tomko, Frederick; Matson, Crawford; and Darrow, Burr, 4,203,583, Cl. 269-234.000.

Dart Industries Inc.: *See*—
Conti, Rino, 4,203,373, Cl. 108-152.000.

Datron Systems, Inc.: *See*—
Fassnacht, Charles J., 4,204,214, Cl. 343-766.000.

Datsenko, Nikolai M. Device for separating heavier impurities from solid bodies in fluid flow. 4,203,832, Cl. 209-44.000.

Daugherty, Yvonne B. Rack for holding soap bars. 4,203,568, Cl. 248-309.00R.

Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, to Eli Lilly and Company. Fungicidal 3-phenyl-5-(substituted methyl-)isoxazoles. 4,203,994, Cl. 424-272.000.

Davies, David L., to Tasco, Inc. Abrasive belt machining apparatus. 4,203,261, Cl. 51-141.000.

Davis, Allen D., Jr.; Johns, Herbert L.; and Lachman, Irwin M., to Corning Glass Works. Porous zirconia containing ceramics. 4,203,772, Cl. 106-40.00R.

Davis, Duane L. Apparatus for testing and straightening arrow shafts and the like. 4,203,308, Cl. 72-34.000.

Dayco Corporation: *See*—
Vitellaro, Frank A., 4,203,476, Cl. 138-122.000.

DDr. Raimund Hauser: *See*—
Besenmatter, Walter, 4,203,661, Cl. 354-53.000.

De Visu International: *See*—
Thenon, Christian, 4,203,234, Cl. 35-76.000.

Deason, James R.: *See*—
Yen, Chung H.; and Deason, James R., 4,203,989, Cl. 424-267.000.

DeBoynton, William L., to Perkin-Elmer Corporation, The. Rotary-to-linear-motion converter. 4,203,328, Cl. 74-25.000.

Decker, Herbert, to Triumph Werke Nurnberg A.G. Flexible shaft coupling. 4,203,304, Cl. 64-13.000.

Deere & Company: *See*—
Stecklein, Gary L., 4,203,684, Cl. 403-158.000.

de Graaf, Stephanus A. G.: *See*—
Hoentjen, Gerrit; de Graaf, Stephanus A. G.; Bijkerk, Albert H.; and de Jonge, Cornelis R. H. I., 4,204,060, Cl. 544-218.000.

Deguemp, Jean-Antoine E. Magnetic prosthetic element. 4,203,216, Cl. 32-2.000.

Dehnert, Johannes: *See*—
Kurtz, Walter; and Dehnert, Johannes, 4,203,894, Cl. 260-156.000.

Deininger, Horst, to Zahnradfabrik Friedrichshafen, AG. Hydraulic auxiliary power steering with energy supply arrangement. 4,203,292, Cl. 60-445.000.

de Jager, Frank, to U.S. Philips Corporation. Minimum group pulse code modem having shape and amplitude codes. 4,204,163, Cl. 375-25.000.

deJong, Geert J., to Akzo N.V. Process for preparing carbon which adsorbs metal ions. 4,203,868, Cl. 252-439.000.

de Jonge, Cornelis R. H. I.: *See*—
Hoentjen, Gerrit; de Graaf, Stephanus A. G.; Bijkerk, Albert H.; and de Jonge, Cornelis R. H. I., 4,204,060, Cl. 544-218.000.

Delehouzee, Leon: *See*—
Blanpain, Jacques; and Delehouzee, Leon, 4,203,188, Cl. 29-420.000.

Della Mura, Pasquale: *See*—
Kupers, Walter; and Della Mura, Pasquale, 4,203,997, Cl. 424-280.000.

Delmon, Bernard M.; Portenart, Michel C.; and Viehe, Heinz, to Unibra Societe Anonyme. Catalytic process for preparing nitriles from amides. 4,203,917, Cl. 260-465.00B.

Delorme, Gerard L. Y. Process for reproducing pictorial works and works achieved with said process. 4,203,789, Cl. 156-59.000.

Delta and Pine Land Company: *See*—
Downing, James D., 4,203,254, Cl. 47-58.000.

De Luca, Paul V.; and Gautier, Charles L., to Porta Systems Corp. Telephone main distributing frame. 4,204,095, Cl. 179-98.000.

DeLuca, Raymond F.; and Schwemm, Gene, to Georgia-Pacific Corporation. Flexible sheet material dispensing of rolls in succession. 4,203,562, Cl. 242-55.300.

Deman, Pierre: *See*—
Ben Sadou, Jean-Claude; and Deman, Pierre, 4,204,172, Cl. 330-134.000.

de Munnik, Frederikus J.: *See*—
van den Hanenberg, Joannes G.; and de Munnik, Frederikus J., 4,204,253, Cl. 364-200.000.

Denka Chemical Corporation: *See*—
Woskow, Marvin Z., 4,203,905, Cl. 260-346.300.

Denki Onkyo Co., Ltd.: *See*—
Onoue, Shoji, 4,204,263, Cl. 363-68.000.

Dennison, Kenneth I., Jr.: *See*—
Cook, Sanford L.; Molisani, Justin J.; and Dennison, Kenneth I., Jr., 4,203,622, Cl. 292-221.000.

DePenti, Kenneth L., to Midland-Ross Corporation. Locksetting mechanism for a rigid jaw coupler. 4,203,523, Cl. 213-100.00W.

Deraedt, Roger: *See*—
Pierdet, Andre; Torelli, Vesperto; and Deraedt, Roger, 4,203,981, Cl. 424-243.000.

Dereppe, Michel; and Leva, Jean, to Solvay & Cie. Moldable compositions based on thermoplastic polymers, synthetic elastomers and vegetable fibrous materials, and use of these compositions for calendering and thermoforming. 4,203,876, Cl. 260-17.40R.

Desso, Jerome A.; Ritchie, Leon T.; and Yeager, Marvin L., to AMP Incorporated. Clip for electrically connecting planar elements, such as solar cells, and the like, in series. 4,203,646, Cl. 339-205.000.

Dethlefsen, Rolf, to Gould Inc. Hybrid circuit breaker with varistor in parallel with vacuum interrupter. 4,204,101, Cl. 200-144.0AP.

DeWald, Raymond C.; Ellis, Ronald M.; and Fitzpatrick, Stephen T., to Firestone Tire & Rubber Company, The. Plastisol resins having improved clarity. 4,203,879, Cl. 260-23.0XA.

DeWall, Richard A. Respiratory gas assembly for bubble oxygenator. 4,203,944, Cl. 422-47.000.

De Wall, Richard A. Bubble oxygenator. 4,203,945, Cl. 422-47.000.

Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Amidinoureas. 4,203,920, Cl. 260-553.00A.

Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Anti-ulcer amidinoureas. 4,204,000, Cl. 424-304.000.

Diamond Shamrock Corporation: *See*—
Schenker, Barry A.; Sugano, Thomas T.; Stillman, Neil W.; and O'Leary, Kevin J., 4,203,822, Cl. 204-301.000.
Temple, Ralph E.; and Gooding, William T., Jr., 4,203,773, Cl. 106-40.00R.
Wiseman, Russell M., 4,203,820, Cl. 204-263.000.

Dickson, Thomas D., Jr. Rotary foodstuff mill and milling process. 4,203,555, Cl. 241-15.000.

Didier Engineering GmbH: *See*—
Meckel, Joachim F.; Rohde, Wolfgang; Siebert, Werner; Wagener, Dietrich; Flockenhaus, Claus; and Galow, Manfred, 4,203,803, Cl. 201-40.000.

Didier-Werke AG: *See*—
Luhrsen, Ernst, 4,203,538, Cl. 222-603.000.

Dietz, William A., to Schurz Corporation. Coupling for joining parts of fluid conveying and fluid controlling devices, and valves utilizing said couplings. 4,203,468, Cl. 137-624.110.

Dietze, Wolfgang; and Bachmann, Gerhard, to Siemens Aktiengesellschaft. Crystal wafer rack structures and the method of producing the same. 4,203,940, Cl. 264-154.000.

Digby, Dennis: *See*—
Keller, John W., Jr.; Digby, Dennis; and Coombes, Alan, 4,203,447, Cl. 128-419.0PG.

Diggs, Richard E. Apparatus for desalinating water. 4,203,805, Cl. 202-176.000.

Diggs, Richard E. Apparatus for desalinating water. 4,203,806, Cl. 202-176.000.

Diggs, Richard E. Guided flow wind power machine with tubular fans. 4,204,126, Cl. 290-55.000.

Digital Equipment Corporation: *See*—
Hitz, George E.; Kaman, Charles H.; Mudge, Craig; O'Loughlin, James F.; and Sullivan, Daniel T., 4,204,252, Cl. 364-200.000.

Diker-Moe Associates: *See*—
Moe, Walter; Bernstein, Lawrence A.; and Heller, David, 4,203,247, Cl. 46-1.00K.

Dill, W. Preston: *See*—
United States of America, National Aeronautics and Space Administration; Dill, W. Preston; Taylor, Rueben E.; and Jeffers, Eldon L., 4,204,037, Cl. 435-3.000.

Dinglinger, Gunter, to Messer Griesheim GmbH. Apparatus for metering small amounts of a low boiling liquefied gas. 4,203,299, Cl. 62-49.000.

Di Perna, James. System for oil and water separation. 4,203,842, Cl. 210-242.00S.

Dixon, Alan G., to Girling Limited. Brake control units. 4,203,630, Cl. 303-24.00C.

Dobbs, Herbert H. Cartridge for reducing bore erosion and extending barrel life. 4,203,364, Cl. 102-38.0WR.

Dr. Ing. Rudolf Hell GmbH: *See*—
Gast, Uwe; Kiralfy, Dennis; Schaefer, Klaus; Slawik, Eckhard; and Wellendorf, Klaus, 4,204,223, Cl. 358-80.000.

Dombrowski, Joseph A.: *See*—
Shimer, Robert M.; Dombrowski, Joseph A.; and Cohen, Sheppard, 4,204,139, Cl. 315-58.000.

Dominion Engineering Works Limited: *See*—
Koeller, Paul, 4,203,703, Cl. 415-113.000.

Donley, Harold E., to PPG Industries, Inc. Conductive metal oxide film for solar energy control. 4,204,028, Cl. 428-432.000.

Donnelly, William R. Exothermic composition and hot pack. 4,203,418, Cl. 126-263.000.

Dorf, Carl: *See*—
Wiener, Joseph, 4,203,219, Cl. 433-74.000.

Dorffel, Jorg; Andrejewski, Werner; and Bartz, Wilfried, to Chemische Werke Huels, AG. Liquid coating compositions containing little or no solvent. 4,204,014, Cl. 427-385.500.

Doty, Warren R.: *See*—
Arcilesi, Donald A.; and Doty, Warren R., 4,204,013, Cl. 427-304.000.

Douglas, George H.; Mir, Ghulam N.; Won, Chong M.; and Studt, William L., to William H. Rorer, Inc. Antisecretory triazinones. 4,203,984, Cl. 424-249.000.

Douglas, George H.: *See*—
Diamond, Julius; and Douglas, George H., 4,203,920, Cl. 260-553.00A.
Diamond, Julius; and Douglas, George H., 4,204,000, Cl. 424-304.000.
Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; and Won, Chong M., 4,203,983, Cl. 424-249.000.
Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; Patel, Dahyabhai M.; Won, Chong M.; and Alioto, Ronald L., 4,203,985, Cl. 424-249.000.

Dow Chemical Company, The: *See*—
Bressler, Wilbur L.; Lowery, Kirby, Jr.; and Vance, Fred L., Jr., 4,204,050, Cl. 526-97.000.
Brewbaker, James L.; and Marzett, Rodrique L., 4,204,048, Cl. 525-343.000.
Brown, William E., 4,204,153, Cl. 324-429.000.
Burnett, Edward L.; and Stack, Eugene V., 4,203,938, Cl. 264-127.000.
Kaiser, Mark E., 4,203,900, Cl. 548-239.000.
Martin, Charles W.; and Ward, Eldon L., 4,203,999, Cl. 424-286.000.

Downing, James D., to Delta and Pine Land Company. Flame treatment apparatus. 4,203,254, Cl. 47-58.000.

Dozier, Harold W., to Mostek Corporation. Depletion controlled switch. 4,204,131, Cl. 307-251.000.

Dozortsev, July K.: *See*—
Ermakov, Vladimir E.; Makarov, Viktor B.; Seidaliev, Fikrat S. O.; Nikiforov, Alexandr M.; Bushev, Alexandr V.; and Dozortsev, July K., 4,203,309, Cl. 72-96.000.

Drachenberg, Werner; and Wolters, Heinrich, to Akzona Incorporated. Process and apparatus for treatment of the exit surface of spinnerets. 4,203,939, Cl. 264-130.000.

Dreikorn, Barry A.: *See*—
Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, 4,203,994, Cl. 424-272.000.

Dresser Industries, Inc.: *See*—
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Drythanol Limited: *See*—
Yarrow, Hyman; and Whitefield, Martin, 4,203,969, Cl. 424-83.000.

Duconge, Claude: *See*—
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,203,501, Cl. 181-120.000.

Duerr, Jonathan H.; and Twitchen, Antony C., to Trend Communications Limited. Print head control. 4,203,679, Cl. 400-320.000.

Dugan, Bernard B., to Colgate-Palmolive Company. Detergent-scrubber article and method for manufacture. 4,203,857, Cl. 252-92.000.

Dulaney, Burrell C. Device for stopping fluid flow from a pipe. 4,203,472, Cl. 137-828.000.

Dunn, Stanley A., to J. E. Enterprises, Inc. Packet for providing thermal protection for documents. 4,203,521, Cl. 206-525.000.

Dunnington, Bruce W.; and Gernert, William B., to Glennel Corporation, The. Abrasive drill. 4,203,262, Cl. 51-204.000.

Du Pont de Nemours, E. I., and Company: *See*—
Brown, Alvin E.; and Van Over, William E., 4,203,322, Cl. 73-194.00A.
Buckson, Gerald I., 4,203,673, Cl. 356-446.000.
Cope, Steven A., 4,203,819, Cl. 204-247.000.
Grossa, Mario; and Sandner, Helmut G., 4,203,770, Cl. 430-270.000.
Smith, Edmund H., Jr., 4,203,672, Cl. 356-431.000.

Dupuis, Jean M., to Northern Telecom Limited. Apparatus for simultaneously loading a multiplicity of pins into a loading fixture for a pin insertion machine. 4,203,698, Cl. 414-404.000.

Durgin, Robert F.: *See*—
Brown, Harry A., Jr.; and Durgin, Robert F., 4,203,974, Cl. 424-166.000.

Dye, Malcolm; and Hyde, Richard C. J., to International Business Machines Corporation. Data processing system power control. 4,204,249, Cl. 364-200.000.

Dynapol: *See*—
Wang, Patricia C.; Wingard, Robert E., Jr.; and Crosby, Guy A., 4,204,007, Cl. 426-548.000.

Dyonics, Inc.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., 4,203,444, Cl. 128-276.000.

E. A. Storz GmbH & Co. KG: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
Gordon, Eric M.; and Koster, William H., 4,203,992, Cl. 424-271.000.
Gordon, Eric M., 4,203,993, Cl. 424-271.000.

Eagle Electric Mfg. Co., Inc.: *See*—
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Eastman Kodak Company: *See*—
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Clifton, Jerry L.; Gentile, Ralph; Hurlbut, Russell G.; and King, James L., 4,203,664, Cl. 355-64.000.
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Eaton Corporation: *See*—
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Soeters, Raymond A., Jr., 4,203,397, Cl. 123-90.160.

Ebauches, S.A.: *See*—
Ziegler, Jacques; Schneiter, Ali; and Grandjean, Remy, 4,203,280, Cl. 368-187.000.

Eberle, William J., to General Battery Corporation. Method of dumping and collecting corrosive substances from automotive batteries. 4,203,699, Cl. 414-415.000.

Eberlein, Werner: *See*—
Schutt, Wolfgang; Jensen, Hans-Ludwig; Eberlein, Werner; and Schoppe, Gunter, 4,203,817, Cl. 204-180.00R.

Ebner, Peter R., to Itek Corporation. Phototypesetter carriage detent mechanism. 4,203,330, Cl. 74-527.000.

Economopoulos, Marios; and Respen, Yves J., to Centre de Recherches Metallurgiques. Process for improving the quality of steel sections. 4,203,783, Cl. 148-12.400.

Edgecombe, David A., to Babcock & Wilcox Company, The. Tubing with formed ends for heat exchangers. 4,203,273, Cl. 53-399.000.

Ediny, Jury G.: *See*—
Vasilevsky, Petr N.; Ediny, Jury G.; and Parfinenko, Ivan V., 4,203,429, Cl. 128-1.00R.

Eek, Lars: *See*—
Emgard, Lennart; Lascelles, Alan; and Eek, Lars, 4,204,006, Cl. 426-520.000.

Egener, Ernst-Gunter; and Kindermann, Wolfgang, to Kraftwerk Union Aktiengesellschaft. Monitoring device for steam-turbine valves. 4,203,471, Cl. 137-637.000.

Eggermont, Ludwig D. J., to U.S. Philips Corporation. Non-recursive digital filter with reduced output sampling frequency. 4,204,177, Cl. 333-166.000.

Ehlers, Klaus-Peter: *See*—
Schroter, Klaus; Scheibitz, Wolfgang; and Ehlers, Klaus-Peter, 4,203,956, Cl. 423-321.00S.

Eichenberg, Norbert: *See*—
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Eidelman, Lev G.: *See*—
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Electric Power Research Institute, Inc.: *See*—
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King, Randall N., 4,204,035, Cl. 429-104.000.
Electro Optik GmbH & Co. KG: *See*—
Menke, Josef F., 4,204,122, Cl. 250-347.000.
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Koppel, Gary A.; and Cooper, Robin D. G., 4,203,896, Cl. 260-239.00A.
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,204,039, Cl. 435-118.000.
Elkay Manufacturing Company: *See*—
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Ellis, Herbert B., to United States of America, Air Force. Line-of-sight stabilization reflector assembly. 4,203,654, Cl. 350-285.000.
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DeWald, Raymond C.; Ellis, Ronald M.; and Fitzpatrick, Stephen T., 4,203,879, Cl. 260-23.0XA.
Ellithorpe, Ernest R.; and Ellithorpe, Richard C., to Western Sulfur Remelters Ltd. Apparatus for sulfur melting by lateral displacement of heating element. 4,203,625, Cl. 299-6.000.
Ellithorpe, Richard C.: *See*—
Ellithorpe, Ernest R.; and Ellithorpe, Richard C., 4,203,625, Cl. 299-6.000.
Elsasser, A. Frederick: *See*—
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Elstrom, Britt, administrator: *See*—
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Elstrom, Tore, deceased (by Elstrom, Britt, administrator); Gustavsen, Per F.; and Kjohl, Olav, to Norsk Hydro a.s. Method for the production of urea of high mechanical strength. 4,204,053, Cl. 528-259.000.
Emgard, Lennart; Lascelles, Alan; and Eek, Lars, to Frigoscandia Contracting AB. Method of thermally treating unpackaged food products. 4,204,006, Cl. 426-520.000.
Energy for Independence, Inc.: *See*—
Ryerson, Joseph L., 4,203,946, Cl. 422-98.000.
Energy Systems Incorporated: *See*—
Hanson, Robert C.; and Hanson, Leon C., 4,203,300, Cl. 62-52.000.
Enokida, Kenji: *See*—
Ichise, Wataru; Kinjo, Yasuo; Enokida, Kenji; and Nihei, Hideharu, 4,203,860, Cl. 252-181.200.
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Enomoto, Takamitsu; Tanaka, Kyoji; Kawamoto, Hiromi; Mizuno, Tamotsu; and Fujinaga, Masao, to Central Glass Company, Limited. Process of preparing calcium hydrogen phosphate anhydride suitable as material for phosphors. 4,203,955, Cl. 423-308.000.
Ensign, Thomas C.: *See*—
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Osmera, Miroslav; Enter, Rudolf; and McCallum, Robert, 4,203,675, Cl. 400-144.200.
Enters, Edward W.; and Kuhn, Weldon R., to Gilson Brothers Company. Snowblower. 4,203,237, Cl. 37-43.00E.
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Erco Industries Limited: *See*—
Cowley, Gerald, 4,203,961, Cl. 423-478.000.
Medves, James S., 4,203,957, Cl. 423-323.000.
Erdmannsdorfer, Hans, to Filterwerk Mann & Hummel GmbH. Separator device for removing oil from an air stream. 4,203,739, Cl. 55-323.000.
Erickson, Alfred C.; and Erickson, Clyde W. Foldable snow shoe. 4,203,236, Cl. 36-123.000.
Erickson, Clyde W.: *See*—
Erickson, Alfred C.; and Erickson, Clyde W., 4,203,236, Cl. 36-123.000.
Erie Manufacturing Company: *See*—
Boss, Gary R., 4,203,573, Cl. 251-133.000.
Ermakov, Vladimir E.; Makarov, Viktor B.; Seidaliev, Fikrat S. O.; Nikiforov, Alexandr M.; Bushev, Alexandr V.; and Dozortsev, July K. Method of pilger rolling of tubes. 4,203,309, Cl. 72-96.000.
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V. Method of making standby primary current sources. 4,203,202, Cl. 29-623.200.
Esquire, Inc.: *See*—
Gaertner, Robert F.; 4,204,148, Cl. 323-22.0SC.
Nuver, Eric L. H., 4,204,141, Cl. 315-311.000.
Ethyl Corporation: *See*—
Hayes, Thomas H., 4,203,552, Cl. 239-337.000.
Raley, Garland E.; Miller, C. W.; and Smith, D. L., 4,203,715, Cl. 425-131.100.
Eto, Kunihiko: *See*—
Nishimura, Hideo; Noda, Shigeo; and Eto, Kunihiko, 4,203,691, Cl. 408-8.000.
Ettinger, Melvyn: *See*—
Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., 4,203,659, Cl. 353-120.000.
Etudes Techniques et Representations Industrielles E.T.R.I.: *See*—
Saint-Amand, Henri, 4,203,704, Cl. 416-93.00R.
Eugster, Walter: *See*—
Boettger, Friedrich; Eugster, Walter; Lenssen, Walter; and Missmahl, Bodo, 4,203,336, Cl. 83-550.000.
Evans, Timothy W., to Upjohn Company, The. Process for the recovery of spectinomycin. 4,203,903, Cl. 260-340.300.
Evergreen Weigh, Inc.: *See*—
Harris, Carl R.; and Blaylock, Robert W., 4,203,497, Cl. 177-134.000.
Exxon Research & Engineering Co.: *See*—
Achia, Biddanda U.; and Shaw, David H., 4,203,824, Cl. 208-33.000.
Bodnick, Sheldon; and Brice, John C., 4,203,828, Cl. 208-213.000.
Hatsell, William A., 4,203,676, Cl. 400-208.000.
Hatsell, William A., 4,203,677, Cl. 400-214.000.
Horner, Ian M., 4,203,186, Cl. 29-157.30R.
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,203,871, Cl. 252-518.000.
Kmak, Walter S.; and Monzo, Charles, 4,203,825, Cl. 208-48.00R.
Metrailer, William J.; and Mueller, David E., 4,203,759, Cl. 75-0.5BA.
Sims, J. Robert, Jr.; Mitchell, Willard N.; and Williamson, Charles W., 4,203,942, Cl. 264-559.000.
Fabreges, Michel, to Regie Nationale des Usines Renault. Electronic control circuit for an electromagnetic decelerator. 4,203,632, Cl. 303-100.000.
Facco, Giuseppe; and Carpaneto, Tomaso, to Italimpliant Societa Italiana Impianti per Asioni. Flat flame burner assembly. 4,203,717, Cl. 431-182.000.
Fachbach, Heinz; Thien, Gerhard; and Kirchweger, Karl, to List, Hans. Internal combustion engine with a sound-reducing encapsulation. 4,203,407, Cl. 123-198.00E.
Fachbach, Heinz; Thien, Gerhard; and Meurer, Peter C., to List, Hans. Low-noise-level internal combustion engine. 4,203,409, Cl. 123-198.00E.
Fackler, Kenneth C., to M & W Gear Company. Thermostatically responsive valve mechanism. 4,203,545, Cl. 236-93.00A.
Falnes, Johannes: *See*—
Budal, Kjell; and Falnes, Johannes, 4,203,294, Cl. 60-497.000.
Farr, David R.; and Horman, Ian, to Societe d'Assistance Technique pour Produits Nestle S.A. Infusing bag containing combination of dried extract and ligneous adsorbent and process of preparing same. 4,204,004, Cl. 426-77.000.
Farr, James B., to Tecumseh Products Company. Unified pump and generator arrangement. 4,203,710, Cl. 417-53.000.
Farrar, Frederick G.: *See*—
Sindoris, Arthur R.; Farrar, Frederick G.; and Schaubert, Daniel H., 4,204,212, Cl. 343-700.0MS.
Farrell, Gerald J.; and Bisonaya, Rudy Y., to Elkay Manufacturing Company. Diaphragm valve for faucets. 4,203,464, Cl. 137-454.200.
Fassnacht, Charles J., to Datron Systems, Inc. Slewing and tracking mechanism for dish structure. 4,204,214, Cl. 343-766.000.
Fast Heat Element Mfg. Co., Inc.: *See*—
Crandell, Walter R., 4,203,197, Cl. 29-611.000.
Fatuzzo, Carol L.; and Foss, George D., to Minnesota Mining and Manufacturing Company. High resolution X-ray intensifying screen with antireflecting substrate. 4,204,125, Cl. 250-486.000.
Faunce, Frank R., to McCord, William F. Dentifrice with topical and systemic phosphate fluoride system. 4,203,966, Cl. 424-52.000.
Featherstone, Ivy. Collapsible tube holding bracket. 4,203,567, Cl. 248-108.000.
Federal-Mogul Corporation: *See*—
Dansereau, John L., 4,203,762, Cl. 75-68.00R.
Fedotov, Oleg A.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.
Feikema, Roger H. Velocipede having separable frame parts. 4,203,612, Cl. 280-287.000.
Feld, Raoul: *See*—
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,203,861, Cl. 252-182.100.
Feldman, Charles F.: *See*—
Batchelor, Robert L.; and Feldman, Charles F., 4,204,029, Cl. 428-441.000.

Feng, Bai-Cwo; and Feng, George C., to International Business Machines Corporation. Two layer resist system. 4,204,009, Cl. 427-36.000.

Feng, George C.: *See—*
Feng, Bai-Cwo; and Feng, George C., 4,204,009, Cl. 427-36.000.

Fenger, Michael L.: *See—*
Bice, Charles D.; Cooper, John H.; and Fenger, Michael L., 4,203,640, Cl. 339-41.000.

Fengler, Georg: *See—*
Bangert, Hans; and Fengler, Georg, 4,203,238, Cl. 37-118.00R.

Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, to Ramseier & Jenzer AG, Carosseriewerke Bern. Bus construction. 4,203,623, Cl. 296-178.000.

Fernandez de Gamboa, Cristina R.: *See—*
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; and Fernandez de Gamboa, Cristina R., 4,204,063, Cl. 546-99.000.

Ferro Corporation: *See—*
Becker, Gordon P., 4,204,021, Cl. 428-325.000.

Fezenko, Igor, to Saint-Gobain Industries. Glass fiberization spinner alloy and use thereof. 4,203,747, Cl. 65-6.000.

Fezenko, Igor: *See—*
Battigelli, Jean A.; Bouquet, Francois; Fezenko, Igor; and Massol, Jean-Jacques, 4,203,746, Cl. 65-6.000.
Battigelli, Jean A.; Bouquet, Francois; and Fezenko, Igor, 4,203,748, Cl. 65-14.000.

Fiala, Jindrich, to Georg Fischer Aktiengesellschaft. Slinging wheel for centrifugal jet machines. 4,203,263, Cl. 51-434.000.

Fiedor, Richard J.: *See—*
Cresswell, Michael W.; and Fiedor, Richard J., 4,204,116, Cl. 250-229.000.

Filipov, Andree N.; Johnson, Richard N.; and Winslow, Christopher N., to United States of America, Army. Radar analog to digital converter. 4,204,198, Cl. 340-347.0AD.

Filterwerk Mann & Hummel GmbH: *See—*
Erdmannsdorfer, Hans, 4,203,739, Cl. 55-323.000.

Finke, Klaus W., to Robert Finke Kunststoff-Spritzguss-Werk. Tilting nozzle closure with dual sealing surfaces. 4,203,534, Cl. 222-402.130.

Finke, Ulrich; Moretto, Hans-Heinrich; Niederprum, Hans; and Vorbruggen, Helmut, to Bayer Aktiengesellschaft. Silyl esters of perfluoroalkanesulphonic acid esters and a process for their preparation. 4,203,914, Cl. 556-428.000.

Firestone Tire & Rubber Company, The: *See—*
DeWald, Raymond C.; Ellis, Ronald M.; and Fitzpatrick, Stephen T., 4,203,879, Cl. 260-23.0XA.
Halasa, Adel F.; Ravagnani, Frederick J.; and Schonfeld, Steven E., 4,203,874, Cl. 260-3.000.
Ranik, William J., Jr., 4,203,481, Cl. 152-330.0RF.

Firmenich, S.A.: *See—*
Cookson, Richard C.; Schulte-Elte, Karl-Heinrich; and Hauser, Arnold, 4,203,907, Cl. 260-346.110.

Fischer & Porter Co.: *See—*
Schmoock, Roy F., 4,204,240, Cl. 361-152.000.

Fisher, Michael H.; and Tolman, Richard L., to Merck & Co., Inc. Sugar derivatives of C-076 compounds. 4,203,976, Cl. 424-180.000.

Fitelson, Michael M.; and Morgan, Dennis R. Optical signal processing apparatus. 4,204,262, Cl. 364-822.000.

Fitzpatrick, Stephen T.: *See—*
DeWald, Raymond C.; Ellis, Ronald M.; and Fitzpatrick, Stephen T., 4,203,879, Cl. 260-23.0XA.

Fivian, Daniel A., to Maag Gear-Wheel & Machine Company Limited. Apparatus for grinding cylindrical gears. 4,203,260, Cl. 51-123.00G.

Flambard, Christian: *See—*
Vieu, Alain; and Flambard, Christian, 4,203,315, Cl. 73-1.00R.

Flanagan, John J. Surfactant system. 4,203,872, Cl. 252-542.000.

Flautt, Robert A.: *See—*
Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., 4,203,504, Cl. 182-10.000.

Fletcher-Terry Company, The: *See—*
Insolio, Thomas A., 4,203,209, Cl. 30-164.950.

Flint-Smith, Virginia K.: *See—*
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Flockenhaus, Claus: *See—*
Meckel, Joachim F.; Rohde, Wolfgang; Siebert, Werner; Wagener, Dietrich; Flockenhaus, Claus; and Galow, Manfred, 4,203,803, Cl. 201-40.000.

FMC Corporation: *See—*
Hare, Ronald B., 4,203,633, Cl. 305-28.000.

Fodor, Joseph E. Solar heater. 4,203,428, Cl. 126-449.000.

Fogle, James W., to Saran Industries, Inc. Knife. 4,203,214, Cl. 30-355.000.

Foley, James W.: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,204,061, Cl. 260-243.300.

Ford Motor Company: *See—*
Giardini, Dante S., 4,203,393, Cl. 123-30.00D.
Nichols, Robert W., 4,203,288, Cl. 60-345.000.

Forman, Harold. High speed tear tape applicator for shrink wrap film packaging. 4,203,270, Cl. 53-133.000.

Forsgren, Ulf E.: *See—*
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,203,972, Cl. 424-114.000.

Foseco International Limited: *See—*
Corbett, Clifford F., 4,203,542, Cl. 235-85.00R.

Foss, Dale R.: *See—*
Minard, James V.; Goldman, Loeb J.; and Foss, Dale R., 4,203,642, Cl. 339-75.0MP.

Foss, George D.: *See—*
Fatuzzo, Carol L.; and Foss, George D., 4,204,125, Cl. 250-486.000.

Foster Wheeler Energy Corporation: *See—*
Tracy, James L., 4,203,718, Cl. 431-188.000.

Foto, Anthony J.: *See—*
Fujitaki, Roy K., 4,203,519, Cl. 206-387.000.

Fox, William M.; and Novotny, Michael A., to Bell Telephone Laboratories, Incorporated. Support structure for thin semiconductor wafer. 4,204,218, Cl. 357-55.000.

Fraenkel, Herbert; Gough, Patrick B.; and Maughan, William S., to Sortex North America, Inc. Method and apparatus for sorting agricultural products. 4,203,522, Cl. 209-558.000.

Framatome: *See—*
Vieu, Alain; and Flambard, Christian, 4,203,315, Cl. 73-1.00R.

Frame, Robert R., to UOP Inc. Process for treating sour petroleum distillates. 4,203,827, Cl. 208-206.000.

Franco, Luigi; and Bertotti, Giorgio, to Centro Richerche Fiat S.p.A. Exhaust silencer for a railway locomotive. 4,203,503, Cl. 181-272.000.

Frank, Arlen W., to United States of America, Agriculture. Tris(N-carbalkoxylaminomethyl)phosphines. 4,204,072, Cl. 560-158.000.

Frank, William R.; and Manz, David F., to General Motors Corporation. Passive occupant restraint system. 4,203,618, Cl. 280-804.000.

Franz, Maurice F.: *See—*
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,203,293, Cl. 60-490.000.

Frederick, Charles V. Method and means for burning corncobs and corn. 4,203,374, Cl. 110-258.000.

Freed, Meier E., to American Home Products Corporation. 3-[Pyridinylalkyl and piperidinylalkyl]-2,3,4,4a-tetrahydro-1H-pyrazino[1,2-a]quinoxalin-5(6H)-ones. 4,203,987, Cl. 424-250.000.

Frenz, Norbert W., Jr.: *See—*
Mead, Ralph T.; Greatbatch, Wilson; Rudolph, Frank W.; and Frenz, Norbert W., Jr., 4,203,201, Cl. 29-623.100.

Freyn, Fritz, to List, Hans. Means for securing an injection nozzle. 4,203,402, Cl. 123-139.0AW.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Rossner, Heinrich-Otto; and Seelig, Henri F., 4,203,760, Cl. 75-12.000.

Fried. Krupp Huttenwerke AG: *See—*
Raquet, Erwin; Tacke, Gerhard; and Heller, Wilhelm, 4,203,546, Cl. 238-1.000.

Friedman, Elizabeth, administratrix: *See—*
Friedman, Meyer, deceased; and Friedman, Elizabeth, administratrix, 4,203,457, Cl. 135-5.00C.

Friedman, Mendel, to United States of America, Agriculture. Method of protecting proteins for animal feed. 4,203,892, Cl. 260-112.00R.

Friedman, Meyer, deceased; and by Friedman, Elizabeth, administratrix. Attachable portable umbrella. 4,203,457, Cl. 135-5.00C.

Frigoscandia Contracting AB: *See—*
Emgard, Lennart; Lascelles, Alan; and Eek, Lars, 4,204,006, Cl. 426-520.000.

Fritz, Werner; and Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft. Coolant loop for the rotor of a turbogenerator with a superconductive exciter winding. 4,204,134, Cl. 310-52.000.

Fritzsche Dodge & Olcott Inc.: *See—*
Barton, Derek H. R.; and Willis, Brian J., 4,203,925, Cl. 568-362.000.

Froidevaux, Jacques H., to Electronic Time Company ETIC S.A. Method of controlling the condition of an electric battery and apparatus for carrying out this method. 4,204,162, Cl. 324-430.000.

Frumkin, Felix M.: *See—*
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,203,688, Cl. 406-85.000.

Fryda, Georg: *See—*
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Fugi Jukogyo Kabushiki Kaisha: *See—*
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Fuji Photo Film Co., Ltd.: *See—*
Inouye, Kozo; and Naito, Hideki, 4,203,768, Cl. 430-388.000.
Suzuki, Fumiyuki; Okutu, Toshimitu; and Ohe, Keitaro, 4,204,070, Cl. 560-94.000.
Takahashi, Koji; Akimoto, Taizo; and Watanabe, Shigeru, 4,203,671, Cl. 356-402.000.

Fujii, Hideo; and Kato, Minoru, to Nippondenso Co., Ltd. Ignition device for an internal combustion engine. 4,203,403, Cl. 123-148.0AC.

Fujiie, Satosi: *See—*
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Fujikawa, Kanichi: *See—*
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Shigehara, Itaru; and Sakashita, Nobuyuki, 4,203,758, Cl. 71-100.000.

Fujinaga, Masao: *See—*
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Fujisada, Hiroyuki: *See—*
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Fujisaki, Masayuki: *See—*
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Fujisawa Pharmaceutical Company, Limited: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,203,897, Cl. 260-239.100.
Fujitaki, Roy K., to Foto, Anthony J. Tape cartridge holder. 4,203,519, Cl. 206-387.000.
Fujiu, Morio: *See*—
Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, 4,204,044, Cl. 435-280.000.
Fujiwhara, Mitsuto; Matsuo, Syunji; Kaneko, Yutaka; Masukawa, Toyoaki; and Kawasaki, Mikio, to Konishiroku Photo Industry Co., Ltd. Amplification process for light-sensitive color photographic material. 4,203,767, Cl. 430-376.000.
Fukui, Toshiyasu: *See*—
Terai, Shiro; Tanabe, Zenichi; and Fukui, Toshiyasu, 4,203,490, Cl. 165-134.00R.
Fukushima, Hiroyuki; Yoshida, Minoru; and Inoue, Hiromasa, to Bunker Ramo Corporation. Wire insertion tool. 4,203,196, Cl. 29-566.300.
Fuller, Colin A.: *See*—
Kegg, Jack P.; Fuller, Colin A.; and Kegg, Geoffrey E., 4,203,177, Cl. 16-24.000.
Funaki, Yuji; Oshita, Hirofumi; Tanaka, Shizuya; Yamamoto, Shigeo; and Kato, Toshiro, to Sumitomo Chemical Company, Limited. 1-Phenyl-2-azolyl-4,4-dimethyl-1-penten-3-ols and the fungicidal use thereof. 4,203,995, Cl. 424-273.00R.
G. D. Searle & Co.: *See*—
Yen, Chung H.; and Deason, James R., 4,203,989, Cl. 424-267.000.
Yen, Chung H., 4,203,990, Cl. 424-267.000.
Gabor, Antal: *See*—
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny L.; and Gabor, Antal, 4,203,688, Cl. 406-85.000.
Gaertner, Robert F., to Esquire, Inc. Regulation circuit. 4,204,148, Cl. 323-22.0SC.
Gaertner, Van R., to Monsanto Company. Method for increasing the sucrose content of growing plants. 4,203,756, Cl. 71-86.000.
GAF Corporation: *See*—
Brown, Michael J., 4,203,932, Cl. 260-923.000.
Brown, Michael J., 4,203,979, Cl. 424-220.000.
Chakrabarti, Paritosh M., 4,203,858, Cl. 252-135.000.
Eiseman, Fred S., 4,203,757, Cl. 71-87.000.
Gruber, Bruce A.; and Lorenz, Donald H., 4,203,919, Cl. 260-465.00D.
Schneider, Louis; and Graham, David E., 4,203,901, Cl. 260-326.50S.
Gall, John C.; Ozimek, Chester E.; and Chamberlain, Albert E., to Sears, Roebuck and Co. Single element typewriter with error correction feature. 4,203,681, Cl. 400-697.000.
Gallant, Charles R.: *See*—
Chapman, Frank X.; Gallant, Charles R.; and Stull, Charles V., 4,204,085, Cl. 174-86.000.
Gallo-Torres, Hugo E., to Hoffmann-La Roche Inc. Diagnostic test for malabsorption. 4,203,967, Cl. 424-9.000.
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Garner, Eugene F., to Allied Chemical Corporation. Polyethylene binder for pyrotechnic composition. 4,203,786, Cl. 149-19.910.
Garner, James W.; and Kelso, Robert G., to Grow Chemical Corp. High solids urethanes and application thereof. 4,203,875, Cl. 260-13.000.
Garofalo, Vito M., to Hi-Flier Manufacturing Company, The. Molded model airplane. 4,203,250, Cl. 46-79.000.
Gartner, Karl, to Josef Gartner & Co., Firma. Climatizing apparatus. 4,203,487, Cl. 165-50.000.
Gasper, Martin J., Jr.; and Black, Theodore W., to Rodale Resources, Inc. Dissolved oxygen regulator. 4,203,389, Cl. 119-3.000.
Gast, Uwe; Kiralfy, Dennis; Schaefer, Klaus; Slawik, Eckhard; and Wellendorf, Klaus, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for making color corrections in the manufacture of printing plates. 4,204,223, Cl. 358-80.000.
Gates, James T. Four way reversing valve for air conditioning systems. 4,203,469, Cl. 137-625.430.
Gates, Timothy P.: *See*—
Coxon, DeWayne; and Gates, Timothy P., 4,203,424, Cl. 126-422.000.
Gau, Shek-Chung: *See*—
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Gau, Shek-Chung, 4,204,216, Cl. 357-8.000.
Gaudiana, Russell A.: *See*—
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Gauthier, Francis: *See*—
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Gaylord, John A.; and Marks, Kenneth A., to H. Koch & Sons Division, Gulf & Western Manufacturing Company. Canopy release manipulating handle. 4,203,181, Cl. 24-230.00A.
Gehman, David R.: *See*—
Kirn, William A.; and Gehman, David R., 4,203,859, Cl. 252-174.230.
Gelenkwellenbau GmbH: *See*—
Sehlbach, Gerd; and Klischat, Ditmar, 4,203,306, Cl. 64-23.000.
Gelman, Stephanie S.: *See*—
Leveckis, Algis S.; and Gelman, Stephanie S., 4,204,105, Cl. 219-10.55E.
General Battery Corporation: *See*—
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Heiser, Joseph I.; and Erb, Edgar M., 4,203,791, Cl. 156-252.000.
General Electric Company: *See*—
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Bogacki, Anthony P., 4,204,194, Cl. 340-147.0SY.
Bogacki, Anthony P., 4,204,195, Cl. 340-151.000.
Cavelos, Arthur A., 4,204,211, Cl. 343-100.0LE.
Goedde, Edwin J.; Holub, Fred F.; and Wilson, Phillip S., 4,203,887, Cl. 260-40.00R.
Lee, Gim F., Jr., 4,203,931, Cl. 525-4.000.
LeGrand, Donald G.; and Vitale, Gina G., 4,204,025, Cl. 428-409.000.
Le Grand, Donald G.; and Vitale, Gina G., 4,204,026, Cl. 428-409.000.
Morris, Jesse L.; and Sugalski, Raymond K., 4,203,206, Cl. 29-731.000.
Pitstick, Martin H., 4,204,204, Cl. 340-712.000.
Proffit, Daniel S.; and Regignano, Maurice, 4,204,248, Cl. 361-388.000.
Sawada, Fred H.; and Howenstein, Melvin, 4,204,156, Cl. 324-158.0MG.
Stetson, Earl W., 4,204,238, Cl. 361-125.000.
Strickland, John J., 4,204,161, Cl. 324-426.000.
General Motors Corporation: *See*—
Bennett, Jack L., 4,203,287, Cl. 60-329.000.
Buchholz, Jeffrey C., 4,203,807, Cl. 204-1.00T.
Cislo, Casimer J.; and Cummings, Seth B., Jr., 4,203,615, Cl. 280-689.000.
Frank, William R.; and Manz, David F., 4,203,618, Cl. 280-804.000.
Kingsley, Charles A.; Spaulding, James R.; and Gifford, William E., 4,203,401, Cl. 123-136.000.
Rissi, Paul, 4,203,465, Cl. 137-487.500.
Snarski, Thomas R., 4,203,958, Cl. 423-351.000.
General Signal Corporation: *See*—
McMullen, James; and Vokac, James, 4,203,387, Cl. 118-715.000.
Genese, Joseph N., to Abbott Laboratories. Additive transfer unit with interlocking means. 4,203,443, Cl. 128-272.300.
Gentile, Albert: *See*—
Tausendfreundt, Jay; and Gentile, Albert, 4,203,208, Cl. 30-155.000.
Gentile, Ralph: *See*—
Clifton, Jerry L.; Gentile, Ralph; Hurlbut, Russell G.; and King, James L., 4,203,664, Cl. 355-64.000.
Geodesic Shelters, Inc.: *See*—
Ivers, Robert P.; and Thimsen, Mark J., 4,203,265, Cl. 52-81.000.
Geomet, Incorporated: *See*—
Milly, George H., 4,204,121, Cl. 250-343.000.
Georg Fischer Aktiengesellschaft: *See*—
Fiala, Jindrich, 4,203,263, Cl. 51-434.000.
Pavlovsky, Rudolf, 4,203,183, Cl. 29-33.00A.
Georgia-Pacific Corporation: *See*—
DeLuca, Raymond F.; and Schwemm, Gene, 4,203,562, Cl. 242-55.300.
Gernert, William B.: *See*—
Dunnington, Bruce W.; and Gernert, William B., 4,203,262, Cl. 51-204.000.
Gerzon, Koert: *See*—
Cullinan, George J.; and Gerzon, Koert, 4,203,898, Cl. 260-244.400.
Getson, Edward F., Jr.; Kelley, John H.; McLaughlin, Albert T.; and Rathbun, Donald J., to Honeywell Information Systems Inc. Range count and main memory address accounting system. 4,204,250, Cl. 364-200.000.
Giardini, Dante S., to Ford Motor Company. Plasma jet ignition engine and method. 4,203,393, Cl. 123-30.00D.
Gibson, Stan, to Graphic Holdings, Ltd. Arm, wrist and shoulder friction type exercising device. 4,203,591, Cl. 272-67.000.
Gibson, Vernon W., Sr., to SEPCO Corporation. Process and apparatus for assembling spiral wound gaskets into gauge rings. 4,203,191, Cl. 29-451.000.
Giesselmann, Hannes; and Skogward, Kenneth, to Husqvarna Aktiebolag. Sewing machine with data circuits. 4,203,378, Cl. 112-158.00E.
Gifford, William E.: *See*—
Kingsley, Charles A.; Spaulding, James R.; and Gifford, William E., 4,203,401, Cl. 123-136.000.
Gilissen, Hermanus P. J.; van Dijk, Petrus R. M.; and van der Sanden, Ludovicus C., to AMP Incorporated. Electrical connector and method of manufacture. 4,203,203, Cl. 29-846.000.
Gill, Harnek S.; and Turner, Charles R., to Schaefer Corporation. Control circuit for refrigerator fan. 4,203,301, Cl. 62-131.000.
Gill, James T., Jr.: *See*—
Hanloser, Kurt J.; Bruchez, Raymond J.; and Gill, James T., Jr., 4,203,285, Cl. 60-261.000.
Gill, Jerry A.: *See*—
Boyadjieff, George I.; and Gill, Jerry A., 4,203,182, Cl. 24-263.00D.

Gillis, John R.; and Halleck, Frank E., to American Sterilizer Company. Method of biocidal sterilization using cyclic subatmospheric pressure conditioning. 4,203,943, Cl. 422-27.000.
Gilmore & Tatge Mfg. Co.: *See*—
Chaffee, Robert C.; and Bauer, Ernest G., 4,203,720, Cl. 432-222.000.
Gilson Brothers Company: *See*—
Enters, Edward W.; and Kuhn, Weldon R., 4,203,237, Cl. 37-43.00E.
Gimag Aktiengesellschaft: *See*—
Berz, Wolfgang, 4,203,736, Cl. 55-96.000.
Gipson, Robert M., to Texaco Development Corp. Boride catalyst for epoxidizing olefinic compounds. 4,203,910, Cl. 260-348.290.
Giraud, Georges; and Mollier, Jean H. System for keeping account of predetermined homogenous units. 4,204,113, Cl. 235-375.000.
Girling Limited: *See*—
Dixon, Alan G., 4,203,630, Cl. 303-24.00C.
Giros, Marcel. Apparatus and method for treatment of elongated flexible material. 4,203,540, Cl. 226-119.000.
Giroux, Hector. Telescopic straight edge. 4,203,227, Cl. 33-458.000.
Glacier Metal Company Limited, The: *See*—
Gray, Stuart A. B., 4,203,184, Cl. 29-149.5DP.
Gladden, Robert S., Jr.; Johnson, Richard J.; Karmazyn, Michael J.; and Tate, Donald L., to Tate Architectural Products, Inc. Structural member and composite panel including same. 4,203,268, Cl. 52-630.000.
Glenn, William E., Jr.; and Ludeke, Carl A., to New York Institute of Technology. Solar air conditioning method and apparatus. 4,203,298, Cl. 62-2.000.
Glennel Corporation, The: *See*—
Dunnington, Bruce W.; and Gernert, William B., 4,203,262, Cl. 51-204.000.
Glock, Hans; and Mayer, Herbert, to Siemens Aktiengesellschaft. Write-read drive arrangement for a bipolar semiconductor memory. 4,204,276, Cl. 365-189.000.
Glock, Robert D.: *See*—
Harris, Delbert L.; Goodnow, Robert A.; Glock, Robert D.; and Kinyon, Joann M., 4,203,968, Cl. 424-92.000.
Goedde, Edwin J.; Holub, Fred F.; and Wilson, Phillip S., to General Electric Company. Modified polyester composition. 4,203,887, Cl. 260-40.00R.
Goldberg, Gerald M. Construction of illuminating ribbon of light bulbs. 4,204,273, Cl. 362-217.000.
Goldman, Loeb J.: *See*—
Minard, James V.; Goldman, Loeb J.; and Foss, Dale R., 4,203,642, Cl. 339-75.0MP.
Goncalves, Antonin, to L'Oreal. Support for toilet bowl deodorizer block. 4,203,172, Cl. 4-231.000.
Gooding, William T., Jr.: *See*—
Temple, Ralph E.; and Gooding, William T., Jr., 4,203,773, Cl. 106-40.00R.
Goodman, Lawrence A., to RCA Corporation. Transistor using liquid crystal. 4,204,217, Cl. 357-23.000.
Goodnow, Robert A.: *See*—
Harris, Delbert L.; Goodnow, Robert A.; Glock, Robert D.; and Kinyon, Joann M., 4,203,968, Cl. 424-92.000.
Goodwin, George I. Container with related indicia. 4,203,240, Cl. 40-310.000.
Goodyear Tire & Rubber Company, The: *See*—
Menapace, Henry R., 4,204,081, Cl. 585-274.000.
Gordon, Eric M.; and Koster, William H., to E. R. Squibb & Sons, Inc. β-Bromopenicillanic acid sulfone. 4,203,992, Cl. 424-271.000.
Gordon, Eric M., to E. R. Squibb & Sons, Inc. 6α-Bromopenicillanic acid sulfone. 4,203,993, Cl. 424-271.000.
Goriletsky, Valentin I.; Mjulendorf, Oleg S.; Radkevich, Alexei V.; and Eidelman, Lev G. Apparatus for growing single crystals from melt with additional feeding of comminuted charge. 4,203,951, Cl. 422-249.000.
Gottlieb, Milton; and Brandt, Gerald B., to Electric Power Research Institute, Inc. Method and means for improved optical temperature sensor. 4,203,326, Cl. 73-339.00R.
Gough, Patrick B.: *See*—
Fraenkel, Herbert; Gough, Patrick B.; and Maughan, William S., 4,203,522, Cl. 209-558.000.
Gould Inc.: *See*—
Chapman, Frank X.; Gallant, Charles R.; and Stull, Charles V., 4,204,085, Cl. 174-86.000.
Dethlefsen, Rolf, 4,204,101, Cl. 200-144.0AP.
Knapp, Edward J., Jr., 4,204,182, Cl. 337-244.000.
Luke, Roger D.; and Rhodes, John M., 4,204,245, Cl. 361-358.000.
Shennett, George D., Jr., 4,203,645, Cl. 339-147.00R.
Shoemaker, William E.; and Wilson, David W., 4,204,114, Cl. 371-25.000.
Zocholl, Stanley E., 4,204,237, Cl. 361-36.000.
Graham, David E.: *See*—
Schneider, Louis; and Graham, David E., 4,203,901, Cl. 260-326.505.
Grandine, Joseph D., 2nd, to Millipore Corporation. Making porous membranes and the membrane products. 4,203,847, Cl. 210-490.000.
Grandine, Joseph D., II, to Millipore Corporation. Processes of making a porous membrane material from polyvinylidene fluoride, and products. 4,203,848, Cl. 210-490.000.
Grandjean, Remy: *See*—
Ziegler, Jacques; Schneiter, Ali; and Grandjean, Remy, 4,203,280, Cl. 368-187.000.
Grantham, Daniel H., to United Technologies Corporation. Method for producing HBr. 4,203,813, Cl. 204-103.000.
Grantham, Daniel H., to United Technologies Corporation. Hydrogen gas generation utilizing a bromide electrolyte and radiant energy. 4,203,814, Cl. 204-129.000.
Graphic Controls Corporation: *See*—
Hepworth, William W., 4,203,682, Cl. 401-198.000.
Graphic Holdings, Ltd.: *See*—
Gibson, Stan, 4,203,591, Cl. 272-67.000.
Gravitter, Robert U.; and Isaacson, William O., to Horner Flooring Company. Affixing cushioning pads to floor sleepers. 4,203,541, Cl. 227-40.000.
Gray, Michael L.: *See*—
Bellinger, Robert M.; and Gray, Michael L., 4,203,741, Cl. 62-24.000.
Gray, Stuart A. B., to Glacier Metal Company Limited, The. Bearings. 4,203,184, Cl. 29-149.5DP.
Greatbatch, Wilson: *See*—
Mead, Ralph T.; Greatbatch, Wilson; Rudolph, Frank W.; and Frenz, Norbert W., Jr., 4,203,201, Cl. 29-623.100.
Greaves, Bruce B. Electrolyzers. 4,203,818, Cl. 204-212.000.
Greco, Alberto: *See*—
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,203,866, Cl. 252-429.00C.
Green, Thomas P.: *See*—
Cromas, Joseph C.; and Green, Thomas P., 4,203,395, Cl. 123-32.0EA.
Gregory, Martha D.: *See*—
Williams, Alice J.; and Gregory, Martha D., 4,203,239, Cl. 40-152.100.
Greiner, Richard W., to Hercules Incorporated. Aqueous fortified rosin dispersions. 4,203,776, Cl. 106-238.000.
Greven, Hendrik M., to Akzona Incorporated. Psychopharmacological peptides suitable for therapeutic administration. 4,203,975, Cl. 424-177.000.
Griesel B.V.: *See*—
Schwind, Heinz G., 4,203,351, Cl. 92-69.00R.
Griffin, Kenneth E. Sign standard. 4,203,242, Cl. 40-610.000.
Grimsrud, Lars. Assembly for dividing a hollow hypodermic needle into two separated flow conduits. 4,203,436, Cl. 128-214.00R.
Grossa, Mario; and Sandner, Helmut G., to Du Pont de Nemours, E. I., and Company. Negative tonable photohardenable element. 4,203,770, Cl. 430-270.000.
Grow Chemical Corp.: *See*—
Garner, James W.; and Kelso, Robert G., 4,203,875, Cl. 260-13.000.
Grube, William L., to MacLean-Fogg Company. Fastener applying tool. 4,203,187, Cl. 29-283.500.
Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. (Acetoxyalkyl) 2-cyano-3,3-diphenylacrylate intermediates for making copolymerizable, ultraviolet light absorber compounds. 4,203,919, Cl. 260-465.00D.
Gruber, Hermann: *See*—
Wellner, Wolfgang; and Gruber, Hermann, 4,204,051, Cl. 528-55.000.
Gruber, Thomas J.; and Smith, Harris W. Heat exchanger. 4,203,415, Cl. 126-110.00R.
GTE Automatic Electric Laboratories Incorporated: *See*—
Reed, Charles J., 4,203,510, Cl. 198-437.000.
Yang, Huan-Tong, 4,204,241, Cl. 361-154.000.
GTE Sylvania Incorporated: *See*—
Shimer, Robert M.; Dombrowski, Joseph A.; and Cohen, Sheppard, 4,204,139, Cl. 315-58.000.
Guestaux, Claude, to Eastman Kodak Company. Radiation-sensitive elements having an antistatic layer containing amorphous vanadium pentoxide. 4,203,769, Cl. 430-631.000.
Guilgue, Jean L., to Metalimphy. Method for identification of coded labels. 4,203,544, Cl. 235-449.000.
Gulf Canada Limited: *See*—
Woods, Hanbury J.; Chase, John D.; and Galvez, Buenaventura B., 4,204,077, Cl. 568-697.000.
Gulf Oil Corporation: *See*—
Batchelor, Robert L.; and Feldman, Charles F., 4,204,029, Cl. 428-441.000.
Gulf Research & Development Company: *See*—
Carr, Norman L.; Schleppy, Ronald, Jr.; Schmid, Bruce K.; and Shah, Yatish T., 4,203,823, Cl. 208-10.000.
Carr, Norman L.; and McGinnis, Edgar L., 4,203,839, Cl. 210-71.000.
Sabourin, Edward T.; and Selwitz, Charles M., 4,204,078, Cl. 568-705.000.
Wu, Ching-Yong; and Kobylinski, Thaddeus P., 4,203,926, Cl. 568-319.000.
Gulf & Western Corporation: *See*—
Hevenor, Charles M., Jr.; and Wood, Kenneth O., 4,204,145, Cl. 318-568.000.
Guntly, Thomas G.: *See*—
Schultz, Curtis L.; and Guntly, Thomas G., 4,203,405, Cl. 123-187.50R.
Gupta, Krishna M. Porosimeter. 4,203,317, Cl. 73-38.000.
Gurley, Thomas M., to RCA Corporation. Television picture compressor. 4,204,227, Cl. 358-138.000.
Gustavsen, Per F.: *See*—
Elstrom, Tore, deceased; Gustavsen, Per F.; and Kjohl, Olav, 4,204,053, Cl. 528-259.000.

Gyugyi, Laszlo; and Brennen, Michael B., to Westinghouse Electric Corp. Static VAR generator with non-linear frequency dependent dynamic gain adjuster. 4,204,151, Cl. 323-119.000.

H. Koch & Sons Division, Gulf & Western Manufacturing Company: *See*—
Gaylord, John A.; and Marks, Kenneth A., 4,203,181, Cl. 24-230.00A.

H.O.P. Consulab Inc.: *See*—
Mathieu, Serge, 4,204,150, Cl. 323-102.000.

Hackenjos, Ernst, to Jaeger, Rolf. Filter media. 4,203,935, Cl. 261-98.000.

Hackett, Barrie H.; and Wissley, Rudolph W., to International Telephone and Telegraph Corporation. Method of construction of electrical heating panels. 4,203,198, Cl. 29-611.000.

Haddock, Fred, to Coburn Optical Industries, Inc. Apparatus for edging ophthalmic lenses. 4,203,259, Cl. 51-97.0NC.

Hadlick, Paul E., Jr. Shingle stripper. 4,203,210, Cl. 30-172.000.

Hafner, Franz X., to E. A. Storz GmbH & Co. KG. Car jacks. 4,203,577, Cl. 254-100.000.

Hafner, Walter V.: *See*—
Morris, Earl L.; Hafner, Walter V.; and Sally, Theodore J., 4,203,173, Cl. 4-427.000.

Hagemann, Julius. Signal processing system for underwater transducer. 4,204,281, Cl. 367-98.000.

Hager, Daniel. Non-return valve. 4,203,466, Cl. 137-543.000.

Hagopian, Arpi: *See*—
Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., 4,203,970, Cl. 424-92.000.

Halasa, Adel F.; Ravagnani, Frederick J.; and Schonfeld, Steven E., to Firestone Tire & Rubber Company, The. Method, composition and product with improved adhesion between a metal member and a contiguous cured rubber skim stock. 4,203,874, Cl. 260-3.000.

Hall, David E.; and Stencel, Edgar L., to VSI Corporation. Blind bolt fastener for low bearing strength materials. 4,203,346, Cl. 85-70.000.

Hallack, Richard D.; and Carter, Tommie B. Method and apparatus for removing precipitated suspended solids from an effluent. 4,203,836, Cl. 210-42.00R.

Halleck, Frank E.: *See*—
Gillis, John R.; and Halleck, Frank E., 4,203,943, Cl. 422-27.000.
Young, Jack H.; and Halleck, Frank E., 4,203,947, Cl. 422-114.000.

Hamburger, Herman, to Zolor Corporation. Articulated boom-dipper-bucket assembly for a tunnel boring machine. 4,203,626, Cl. 299-33.000.

Hamill, Robert L.: *See*—
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,204,039, Cl. 435-118.000.

Hanada, Hiroshi, to Canon Kabushiki Kaisha. Beam shaping optical system. 4,203,652, Cl. 350-182.000.

Hancock, Ronald D.; and Howell, Ian V., to British Petroleum Company Limited, The. Process for the removal of heavy metals and transition metals other than platinum from solution. 4,203,952, Cl. 423-6.000.

Hangauer, David G., Jr., to Textron, Inc. Aqueous colloidal dispersions of tertiary amine salts of urea-urethane polymers and method for manufacture. 4,203,883, Cl. 260-29.2TN.

Hanloser, Kurt J.; Bruchez, Raymond J.; and Gill, James T., Jr., to United States of America, Air Force. Partial swirl augmentor for a turbofan engine. 4,203,285, Cl. 60-261.000.

Hansen, Elmer K. Tool and disk mounting assembly. 4,203,494, Cl. 172-166.000.

Hanson, Joseph B., to Standard Oil Company (Indiana). Polyamine derivatives of oxidized olefinic substituted dicarboxylic acid compounds. 4,203,730, Cl. 44-71.000.

Hanson, Leon C.: *See*—
Hanson, Robert C.; and Hanson, Leon C., 4,203,300, Cl. 62-52.000.

Hanson, Robert C.; and Hanson, Leon C., to Energy Systems Incorporated. Horizontal direct fired water bath propane vaporizer. 4,203,300, Cl. 62-52.000.

Hare, Ronald B., to FMC Corporation. Reduced noise producing idler wheel. 4,203,633, Cl. 305-28.000.

Harris, Carl R.; and Blaylock, Robert W., to Evergreen Weigh, Inc. Portable load scale for mining trucks and the like. 4,203,497, Cl. 177-134.000.

Harris, Charles R.: *See*—
Baker, William, III; and Harris, Charles R., 4,203,496, Cl. 175-329.000.

Harris Corporation: *See*—
Bakula, Richard E.; and McCarthy, Edward C., 4,204,206, Cl. 340-721.000.
Bakula, Richard E.; and McCarthy, Edward C., 4,204,207, Cl. 340-723.000.
McCarthy, Edward C., 4,204,208, Cl. 340-745.000.
Taylor, David L., 4,204,275, Cl. 365-163.000.

Harris, Delbert L.; Goodnow, Robert A.; Glock, Robert D.; and Kinyon, Joann M., to Iowa State University Research Foundation, Inc.; and Burns-Biotec Laboratories, Inc. Combination vaccine for swine dysentery and method of use. 4,203,968, Cl. 424-92.000.

Harris, James H., to International Business Machines Corporation. Multicollector transistor logic circuit. 4,204,130, Cl. 307-215.000.

Hart, Robert L.; Paul, Frank W.; and Sauer, Wolfgang J., to United States of America, Commerce. Universal jig fixture for castings. 4,203,582, Cl. 269-32.000.

Harvey Hubbell, Incorporated: *See*—
Pye, Richard T., 4,204,024, Cl. 428-379.000.

Hasegawa, Gary K., to Continental Group, Inc., The. Self-storing pull strip for easy opening containers. 4,203,528, Cl. 220-269.000.

Hashimoto, Masashi: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,203,897, Cl. 260-239.100.

Haskins, Albert R. Load handling system. 4,203,368, Cl. 104-92.000.

Hasquenoph, Denis, to AGRAM. Path tracking device for spreading or spraying agricultural treatment products or the like. 4,203,226, Cl. 33-185.00V.

Hata, Masahito: *See*—
Noda, Yoichiro; Matsumura, Michio; Chiba, Norio; and Hata, Masahito, 4,203,815, Cl. 204-159.200.

Hatsell, William A., to Exxon Research & Engineering Co. Ribbon mounting apparatus. 4,203,676, Cl. 400-208.000.

Hatsell, William A., to Exxon Research & Engineering Co. Printer ribbon lift assembly. 4,203,677, Cl. 400-214.000.

Hattori, Hiroyuki: *See*—
Kishi, Hirotoshi; Hattori, Hiroyuki; and Shimizu, Katsuichi, 4,203,587, Cl. 271-293.000.

Hauser, Arnold: *See*—
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Havezov, Ivan: *See*—
Stoeppler, Markus; and Havezov, Ivan, 4,203,840, Cl. 210-83.000.

Hawkes, Ivor, to United States of America, Interior. Method of anchoring a vibrating wire into a hollow gauge body. 4,203,192, Cl. 29-452.000.

Hawrylo, Frank Z., to RCA Corporation. Method of epitaxially depositing cadmium sulfide. 4,203,785, Cl. 148-171.000.

Hayashi, Hisao: *See*—
Matsushita, Takeshi; Mamine, Takayoshi; Hayashi, Hisao; and Nishiyama, Kazuo, 4,203,780, Cl. 148-1.500.

Hayashi, Mitsuyoshi: *See*—
Kudo, Shiro; and Hayashi, Mitsuyoshi, 4,204,005, Cl. 426-518.000.

Hayashi, Tadayoshi: *See*—
Mase, Yoshio; Hayashi, Tadayoshi; Natsuume, Shinichi; Kobayashi, Yasuhisa; and Moriya, Yoshiyuki, 4,203,949, Cl. 422-179.000.

Hayes, Fay A.; and Hayes, Leonard L. Method of heating plastic pipe. 4,203,721, Cl. 432-10.000.

Hayes, Leonard L.: *See*—
Hayes, Fay A.; and Hayes, Leonard L., 4,203,721, Cl. 432-10.000.

Hayes, Thomas H., to Ethyl Corporation. Pressurized atomizer. 4,203,552, Cl. 239-337.000.

Hayfield, Peter C. S.: *See*—
Warne, Michael A.; and Hayfield, Peter C. S., 4,203,810, Cl. 204-38.00B.

Hayssen Manufacturing Company: *See*—
James, Robert C., 4,203,694, Cl. 414-28.000.

Hazenbroek, Jack. Gizzard processing system. 4,203,178, Cl. 17-50.000.

Heckle, William A.: *See*—
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., III, 4,203,808, Cl. 204-23.000.

Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Gau, Shek-Chung, to University Patents, Inc. Electrically conducting doped polyacetylene film exhibiting n-type electrical conductivity and method of preparing same. 4,204,216, Cl. 357-8.000.

Hefele, Josef, to Kufner Textilwerke KG. Raster-like heat sealable adhesives on substrates. 4,204,017, Cl. 428-160.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Pollich, Gerhard, 4,203,361, Cl. 101-177.000.

Heine, Charles A. Slipper holder. 4,203,175, Cl. 5-503.000.

Heiner, Robert James: *See*—
Mims, Matlock M., 4,203,437, Cl. 128-229.000.

Heinzl, Joachim, to Siemens Aktiengesellschaft. Process and an arrangement for reducing the redundancy of binary character sequences which describe characters or graphic patterns. 4,204,090, Cl. 178-30.000.

Heiser, Joseph I.; and Erb, Edgar M., to General Battery Corporation. Method of making a multi-slit self-sealing ignition-arrester battery vent. 4,203,791, Cl. 156-252.000.

Held, Gerhard R. Gear finishing machine. 4,203,258, Cl. 51-95.0GH.

Heller, David: *See*—
Moe, Walter; Bernstein, Lawrence A.; and Heller, David, 4,203,247, Cl. 46-1.00K.

Heller, Wilhelm: *See*—
Raquet, Erwin; Tacke, Gerhard; and Heller, Wilhelm, 4,203,546, Cl. 238-1.000.

Hellige GmbH: *See*—
Hofert, Wilhelm A.; Schlussel, Peter F.; Sutor, Anton H.; and Ullrich, Georg J., 4,203,446, Cl. 128-329.00R.

Heltsley, Alan T.: *See*—
Zitelli, William E.; and Heltsley, Alan T., 4,204,258, Cl. 364-494.000.

Henrick, Clive A.: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,204,071, Cl. 560-100.000.

Hepworth, William W., to Graphic Controls Corporation. Insert molded instrument marker pen with anchored stylus. 4,203,682, Cl. 401-198.000.

Hercules Incorporated: *See*—
Greiner, Richard W., 4,203,776, Cl. 106-238.000.

Herdzina, Frank J.: *See*—
Vandlik, Robert P.; and Herdzina, Frank J., 4,203,314, Cl. 72-427.000.

Herion-Werke KG: *See*—
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Herman Miller, Inc.: *See—*
Mitchell, Terry L.; and Immink, David A., 4,203,609, Cl. 280-47.110.
Hermann Heye KG: *See—*
Becker, Kurt; Buogert, Hermann; Schwarzer, Siegfried; and Seidel, Hans-Georg, 4,203,752, Cl. 65-163.000.
Herting, Karl-Heinz: *See—*
Reichel, Hilmar; Klauke, Guenter; Herting, Karl-Heinz; and Pointner, Martin, 4,203,531, Cl. 228-1.00A.
Hess, W. Graig, to United Technologies Corporation. Radial wafer airfoil construction. 4,203,706, Cl. 416-97.00A.
Heuze, Philippe, to Thomson-CSF. Video contrast expanding arrangement. 4,204,229, Cl. 358-169.000.
Hevenor, Charles M., Jr.; and Wood, Kenneth O., to Gulf & Western Corporation. Method of selecting the cutting position for a cigar wrapper on a tobacco leaf. 4,204,145, Cl. 318-368.000.
Hexagear Industries Limited: *See—*
On, Lo Hou, 4,203,550, Cl. 239-102.000.
Hi-Flier Manufacturing Company, The: *See—*
Garofalo, Vito M., 4,203,250, Cl. 46-79.000.
Hickman, Jack L. Raised rib and stock elevator attachment for shotguns. 4,203,243, Cl. 42-73.000.
Hickman, Jack L. Gunstock elevator attachment. 4,203,244, Cl. 42-73.000.
Hiebert, Jacob: *See—*
Warkentin, Aaron J.; and Hiebert, Jacob, 4,203,274, Cl. 53-537.000.
Hildebrandt, Bodo; Janele, Erich; and Steigerwald, Franz, to Wella Aktiengesellschaft. Container. 4,203,517, Cl. 206-221.000.
Hill, Michael D. Burglar alarm. 4,203,383, Cl. 116-95.000.
Hill, Richard D., to Midgitronics Inc. Position control system. 4,204,144, Cl. 318-568.000.
Hillenkamp, Franz: *See—*
Aberle, Lothar; Bank, Walter; Hillenkamp, Franz; Kaufmann, Raimund; Nitsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,204,117, Cl. 250-287.000.
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Hirai, Akira; Nishimoto, Kazuyuki; and Kuroki, Hisataka, to Matsushita Electric Industrial Co., Ltd. Flame-retardant silicone composition having X-ray shielding ability. 4,203,886, Cl. 260-37.0SB.
Hirai, Hirotomo: *See—*
Yagi, Kenjiro; and Hirai, Hirotomo, 4,204,205, Cl. 340-719.000.
Hirai, Mitsuru, to Yoshida Kogyo K.K. Apparatus for feeding workpieces intermittently. 4,203,514, Cl. 198-774.000.
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Nakae, Hideo; Ozaki, Toshinori; Nakane, Kazunori; and Shimaguchi, Takashi, 4,203,195, Cl. 29-505.000.
Obata, Yukio; and Fujisaki, Masayuki, 4,203,307, Cl. 68-17.00R.
Sakai, Akira; and Matsumura, Jube, 4,203,297, Cl. 60-660.000.
Shimizu, Norio; Odawara, Youji; Yamaguchi, Tetsuo; Saitou, Setsuo; Nakaoka, Azuma; and Ichihashi, Kazuaki, 4,203,841, Cl. 210-205.000.
Suganuma, Tsuneo; Ishida, Koji; Satoh, Shin; Sugie, Mamoru; Katsuyama, Toshio; and Toda, Gyozo, 4,203,743, Cl. 65-3.00A.
Sugawara, Katsuro; Nakazawa, Yukiyoshi; and Itoh, Katsuhiko, 4,203,799, Cl. 156-601.000.
Takasaki, Yoshitaka; Kita, Yasuhiro; Nakagawa, Junichi; and Ishizuka, Kohei, 4,204,176, Cl. 333-28.00R.
Hitz, George E.; Kaman, Charles H.; Mudge, Craig; O'Loughlin, James F.; and Sullivan, Daniel T., to Digital Equipment Corporation. Writeable control store for use in a data processing system. 4,204,252, Cl. 364-200.000.
Ho, Roland K., to Motorola, Inc. Electromechanical pressure transducer. 4,204,244, Cl. 361-283.000.
Hodges, Kenneth M. Tennis ball feeder and random server. 4,203,413, Cl. 124-78.000.
Hoechst Aktiengesellschaft: *See—*
Ahlgrim, Michael; Mietens, Gerhard; Krieger, Wilfried; and Sorbe, Gunter, 4,203,637, Cl. 339-5.00R.
Bergner, Dieter; and Danner, Max, 4,203,812, Cl. 204-94.000.
Cramer, Jurgen, 4,203,811, Cl. 204-78.000.
Cramer, Jurgen; and Lindner, Werner, 4,203,821, Cl. 204-268.000.
Konz, Elmar; and Pistorius, Rudolf, 4,204,076, Cl. 568-648.000.
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Schroter, Klaus; Scheibitz, Wolfgang; and Ehlers, Klaus-Peter, 4,203,956, Cl. 423-321.00S.
Vertesy, Laszlo; and Huber, Gerhard, 4,204,058, Cl. 544-4.000.
Wirtz, Peter; and Broall, Richard, 4,203,850, Cl. 252-8.050.
Hoentjen, Gerrit; de Graaf, Stephanus A. G.; Bijkerk, Albert H.; and de Jonge, Cornelis R. H. I., to Akzona Incorporated. Novel monochloro-s-triazine derivatives. 4,204,060, Cl. 544-218.000.
Hoerauf, Werner: *See—*
Matthies, Paul; Kunde, Joachim; and Hoerauf, Werner, 4,204,049, Cl. 526-65.000.
Hofert, Wilhelm A.; Schlussel, Peter F.; Sutor, Anton H.; and Ullrich, Georg J., to Hellige GmbH. Precision spring lancet. 4,203,446, Cl. 128-329.00R.
Hoffman, Jacob M., Jr.: *See—*
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Hoffmann-La Roche Inc.: *See—*
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Holland, George W.; and Rosen, Perry, 4,204,074, Cl. 562-503.000.
Kienzle, Frank, 4,204,073, Cl. 560-231.000.
Kompis, Ivan; and Wick, Alexander E., 4,203,980, Cl. 424-229.000.
Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, 4,204,044, Cl. 435-280.000.
Hoge, John H.; and Hubbard, John H. Process for removal of discrete particulates and solutes from liquids by foam flotation. 4,203,837, Cl. 210-44.000.
Hohmann, Walter; Wunderlich, Klaus; and Seidler, Helmut, to Bayer Aktiengesellschaft. Process for the mononitration of anthraquinone. 4,203,895, Cl. 260-369.000.
Hohn, Max G.: *See—*
Schuster, Waldemar; and Hohn, Max G., 4,203,352, Cl. 92-94.000.
Holland, George W.; and Rosen, Perry, to Hoffmann-La Roche Inc. 16-Substituted prostaglandins. 4,204,074, Cl. 562-503.000.
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Hom, Jim M.: *See—*
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Okada, Motohiro, 4,203,616, Cl. 280-737.000.
Tomita, Takao; Anno, Nobuo; and Yamamoto, Hitoshi, 4,203,507, Cl. 188-317.000.
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Honeywell Inc.: *See—*
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Singh, Gurnam, 4,203,327, Cl. 73-721.000.
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Hopkins, Richard B., to Knoll International, Inc. Writing tablet. 4,203,624, Cl. 297-162.000.
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Horner, Ian M., to Exxon Research & Engineering Co. Heat transfer. 4,203,186, Cl. 29-157.30R.
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., to Exxon Research & Engineering Co. Method of making lead and bismuth ruthenate and iridate pyrochlore compounds. 4,203,871, Cl. 252-518.000.
Horwitt, Laurence G.; and Mattis, Donald J., to Sun Chemical Corporation. Manual electric cigar lighter. 4,204,108, Cl. 219-265.000.
Horwitt, Laurence G.; and Mattis, Donald J., to Sun Chemical Corporation. Automatic electric cigar lighter. 4,204,109, Cl. 219-265.000.
Hosaka, Akio: *See—*
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Hose, Eddy, to United States of America, Air Force. Synthetic array radar command air launched missile system. 4,204,210, Cl. 343-6.00R.
Houk, Theodore L.: *See—*
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Hoya Lens Corporation: *See—*
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Hoyer, August, to Xerox Corporation. Multifeed detector. 4,203,586, Cl. 271-34.000.
Hsu, Ying-Yen, to Timex Corporation. Liquid crystal composition. 4,203,862, Cl. 252-299.000.
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Hubele, Adolf, to Ciba-Geigy Corporation. Methods of using N-(substituted)-N-alkoxy carbonyl anilino compounds. 4,204,002, Cl. 424-309.000.

Huber, Gerhard: *See*—
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Huchler, Otto H.: *See*—
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Hughes Aircraft Company: *See*—
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Hungerford, William R., to Bendix Corporation, The. Numerical control resolver position measuring device. 4,204,257, Cl. 364-474.000.
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Clifton, Jerry L.; Gentile, Ralph; Hurlbut, Russell G.; and King, James L., 4,203,664, Cl. 355-64.000.
Hurley, Donald L.; Wessel, Francis H.; and Bange, Joseph B., to Western States Machine Company, The. Power-operated loading gate for centrifugal machines incorporating an auxiliary drive device. 4,203,570, Cl. 251-14.000.
Huschka, Hans: *See*—
Knotik, Karl; Leichter, Peter; Proksch, Emil; and Huschka, Hans, 4,203,863, Cl. 252-301.10W.
Husqvarna Aktiebolag: *See*—
Giesselmann, Hannes; and Skogward, Kenneth, 4,203,378, Cl. 112-158.00E.
Hutchins, Loren H., Jr., to Simplex Wire and Cable Company. Capacitance-compensated cable. 4,204,129, Cl. 307-147.000.
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Hydes, Paul C.; and Malerbi, Bernard W., to Johnson, Matthey & Co., Limited. Compositions containing platinum. 4,203,912, Cl. 260-429.00R.
Hydroacoustics Inc.: *See*—
Nelson, David E., 4,204,278, Cl. 367-39.000.
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Hyman, Seymour: *See*—
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Ichihashi, Kazuaki: *See*—
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Ichise, Wataru; Kinjo, Yasuo; Enokida, Kenji; and Nihei, Hideharu, to Tokyo Shibaura Electric Co., Ltd. Nitrogen-emitting composition to be used with flash getter materials. 4,203,860, Cl. 252-181.200.
ICI Americas Inc.: *See*—
Rashbrook, Robert B., 4,203,888, Cl. 260-45.70P.
Igarashi, Taizo: *See*—
Ishizaki, Takaharu; Igarashi, Taizo; and Shimizu, Hirozumi, 4,203,729, Cl. 44-51.000.
Ii, Tadao; Tanaka, Takashi; and Akaba, Hayao, to Hoya Lens Corporation. Lensmeter. 4,203,666, Cl. 356-124.000.
Ikedo, Masaru: *See*—
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Illinois Water Treatment Company: *See*—
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Imai, Tamotsu; and Homeier, Edwin H., to UOP Inc. Preparation of alkyl pyridines. 4,204,066, Cl. 546-348.000.
Imataki, Mitsumasa; Mochizuki, Mikio; and Shibuya, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Abnormal voltage protection device. 4,204,239, Cl. 361-127.000.
IMI Marston Limited: *See*—
Warne, Michael A.; and Hayfield, Peter C. S., 4,203,810, Cl. 204-38.00B.
Immink, David A.: *See*—
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Baker, Alan S., 4,203,877, Cl. 260-18.00R.
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Bye, Ashley D., 4,203,867, Cl. 252-429.00B.
Imperial Knife Associated Companies, Inc.: *See*—
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Imrie, James A. High and low voltage measuring apparatus employing a single display and impedance matching. 4,204,152, Cl. 324-390.000.
Inagaki, Katsumi: *See*—
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Independent Broadcasting Authority: *See*—
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Ing. C. Olivetti & C., S.p.A.: *See*—
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Carlstedt, Bo R., 4,203,843, Cl. 210-262.000.
Ino, Haruko; and Ino, Risaburo. Apparatus for cleaning water containing foreign particles such as suspended matters or oil. 4,203,849, Cl. 210-522.000.
Ino, Makoto: *See*—
Takamizawa, Minoru; Abe, Akira; Ono, Yoshiaki; Sugimori, Yutaka; Kishibayashi, Tetsuo; and Ino, Makoto, 4,204,030, Cl. 428-447.000.
Ino, Risaburo: *See*—
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Inoue, Hiromasa: *See*—
Fukushima, Hiroyuki; Yoshida, Minoru; and Inoue, Hiromasa, 4,203,196, Cl. 29-566.300.
Inouye, Kozo; and Naito, Hideki, to Fuji Photo Film Co., Ltd. Silver halide color photographic material and method for formation of color photographic images. 4,203,768, Cl. 430-388.000.
Insolio, Thomas A., to Fletcher-Terry Company, The. Attachment for hand glass cutter. 4,203,209, Cl. 30-164.950.
Institut National de la Recherche Agronomique: *See*—
Pery, Pierre; Luffau, Gerard; Poulain nee Charley, Joelle; and Petit, Agnes, 4,203,893, Cl. 260-121.000.
Institute Francais du Petrole: *See*—
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,203,501, Cl. 181-120.000.
Instructo/McGraw-Hill, Inc.: *See*—
Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., 4,203,659, Cl. 353-120.000.
Interlego A.G.: *See*—
Tapdrup, Erik P., 4,203,248, Cl. 46-22.000.
International Business Machines Corporation: *See*—
Arrasmith, Fred V., 4,203,589, Cl. 271-258.000.
Dye, Malcolm; and Hyde, Richard C. J., 4,204,249, Cl. 364-200.000.
Feng, Bai-Cwo; and Feng, George C., 4,204,009, Cl. 427-36.000.
Harris, James H., 4,204,130, Cl. 307-215.000.
Key, Brian D.; Smith, James; and Kerigan, Shaun C., 4,204,089, Cl. 178-30.000.
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Noble, David L., 4,204,234, Cl. 360-77.000.
Schroeder, Eugene N., 4,204,193, Cl. 340-146.30H.
Staiger, Dieter, 4,203,543, Cl. 371-24.000.
International Telephone and Telegraph Corporation: *See*—
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Sawyer, Edgar W., Jr., 4,203,864, Cl. 252-314.000.
Interx Research Corporation: *See*—
Bodor, Nicolae S., 4,204,065, Cl. 546-316.000.
Inui, Taiji: *See*—
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Iowa State University Research Foundation, Inc.: *See*—
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Isaacs, Jose A. C.: *See*—
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Isailovic, Jordan, to MCA Disco-Vision, Inc. Method and means for encoding and decoding digital data. 4,204,199, Cl. 340-347.0DD.
Ishida, Koji: *See*—
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Ishigaki, Yukinobu; and Muraoka, Teruo, to Victor Company of Japan, Limited. Cancellation of interference distortions caused by intermodulation between FM signals on adjacent channels. 4,204,091, Cl. 179-1.0GB.
Ishihara Sangyo Kaisha Limited: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Shigehara, Itaru; and Sakashita, Nobuyuki, 4,203,758, Cl. 71-100.000.
Ishizaki, Takaharu; Igarashi, Taizo; and Shimizu, Hirozumi, to Nippon Oil & Fats Co. Ltd. Method for producing coal dispersing oil compositions. 4,203,729, Cl. 44-51.000.
Ishizuka, Kohei: *See*—
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Ishizuka, Masaaki: *See*—
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Isoard, Bernard, to Rhone-Poulenc-Textile. Process and device for the winding-up of textile yarn. 4,203,560, Cl. 242-45.000.
Isotton, Adriano, to Mariani, Angelo. Termination on electric power cables for normal, high and very high voltages. 4,204,083, Cl. 174-9.00F.
Italimpliant Societa Italiana Impianti per Asioni: *See*—
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Ito, Hiroshi: *See*—
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Ito, Sadayoshi: *See*—
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Ito, Tadashi: *See*—
Uchidoi, Masanori; Tsunekawa, Tokuichi; Aizawa, Hiroshi; Taguchi, Tetsuya; Ito, Tadashi; and Takishima, Yoshiyuki, 4,203,660, Cl. 354-31.000.
Ito, Yukio: *See*—
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Ivanov, Jury N.; Artemov, Konstantin V.; Suris, Leonid I.; and Bozhenov, Jury F. Container securing device. 4,203,372, Cl. 410-67.000.
Ivers, Robert P.; and Thimsen, Mark J., to Geodesic Shelters, Inc. Hub and strut system for geodesic domes. 4,203,265, Cl. 52-81.000.
J. E. Enterprises, Inc.: *See*—
Dunn, Stanley A., 4,203,521, Cl. 206-525.000.
J. I. Case Company: *See*—
Youngers, Stephen A., 4,203,291, Cl. 60-433.000.
J-Mark, Inc.: *See*—
Makela, Martin A., 4,203,611, Cl. 280-163.000.
Jacob, Hermann. Method for purifying particulate mould material. 4,203,777, Cl. 134-7.000.
Jaeger, Rolf: *See*—
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Jahrig, Siegfried; and Liebig, Reinhard, to Siemens Aktiengesellschaft. Driving apparatus for electric power circuit breakers. 4,204,103, Cl. 200-153.0SC.
James, Robert C., to Hayssen Manufacturing Company. Squaring reams of paper for wrapping. 4,203,694, Cl. 414-28.000.
Jamison, John W.; Welty, William R.; and Masciello, Vincent A., deceased (by Masciello, Doris E., heir), to Hughes Aircraft Company. Printed circuit board hole cleaner. 4,203,257, Cl. 51-2.00R.
Janele, Erich: *See*—
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Janiszewski, Stephen, to Teletype Corporation. Means for establishing various communication conditions in a cryptographic system. 4,204,088, Cl. 178-22.000.
Janning, Jorg; Kaminsky, Walter; Sinn, Hansjorg; and Tysarcyk, Stanislav, to Carl Robert Eckelmann AG. Apparatus for the pyrolysis of pieces of rubber or like material, especially used motor vehicle tires. 4,203,804, Cl. 202-121.000.
Janssens, Wilhelmus: *See*—
Claeys, Danie A.; Reyniers, Albert A.; and Janssens, Wilhelmus, 4,203,765, Cl. 430-252.000.
Javeri, Rupin J., to Motorola, Inc. Periodic engine speed monitoring circit utilizing sampling circuitry. 4,204,157, Cl. 324-166.000.
Jean Walterscheid GmbH: *See*—
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Jeffers, Eldon L.: *See*—
United States of America, National Aeronautics and Space Administration; Dill, W. Preston; Taylor, Rueben E.; and Jeffers, Eldon L., 4,204,037, Cl. 435-3.000.
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Jenkins Metal Corporation: *See*—
Collins, Walter W., 4,203,167, Cl. 2-322.000.
JENOPTIK JENA G.m.b.H.: *See*—
Schutt, Wolfgang; Jensen, Hans-Ludwig; Eberlein, Werner; and Schoppe, Gunter, 4,203,817, Cl. 204-180.00R.
Jensen, Hans-Ludwig: *See*—
Schutt, Wolfgang; Jensen, Hans-Ludwig; Eberlein, Werner; and Schoppe, Gunter, 4,203,817, Cl. 204-180.00R.
Jensen, Roger S. Self-centering hole saw adapter. 4,203,692, Cl. 408-96.000.
Jessup, James L.; and Elliott, Eugene W., to Hollister Incorporated. Gas-venting filter assembly for collection device. 4,203,445, Cl. 128-283.000.
Jockel, Heinz: *See*—
Supp, Emil; Jockel, Heinz; Krumm, Hagen; and Marschner, Friedemann, 4,203,915, Cl. 260-449.500.
Johannsen, Peter: *See*—
Peter, Julius; Johannsen, Peter; and Mauk, Gerhard, 4,203,480, Cl. 152-209.0NT.
Johansson, Rolf G. Car hoist. 4,203,505, Cl. 187-81.700.
Johns, Herbert L.: *See*—
Davis, Allen D., Jr.; Johns, Herbert L.; and Lachman, Irwin M., 4,203,772, Cl. 106-40.00R.
Johnson, Duane P.: *See*—
Sarian, Suren; and Johnson, Duane P., 4,204,159, Cl. 324-232.000.
Johnson, Earl R., to Loffland Brothers Company. Hydraulic elevating ramp. 4,203,575, Cl. 254-88.000.
Johnson, Gordon W.: *See*—
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,203,293, Cl. 60-490.000.
Johnson, James R.; and Chirash, William, to Colgate-Palmolive Company. Softener, bleach and anti-cling composition. 4,203,852, Cl. 252-8.800.
Johnson, Lanny L.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., 4,203,444, Cl. 128-276.000.
Johnson, Matthey & Co., Limited: *See*—
Hydes, Paul C.; and Malerbi, Bernard W., 4,203,912, Cl. 260-429.00R.
Johnson, Philip A.; and McCarthy, Alfred F., to Aavid Engineering, Inc. Self-fastened heat sinks. 4,203,488, Cl. 165-80.00B.
Johnson, Richard J.: *See*—
Gladden, Robert S., Jr.; Johnson, Richard J.; Karmazyn, Michael J.; and Tate, Donald L., 4,203,268, Cl. 52-630.000.
Johnson, Richard N.: *See*—
Filipov, Andree N.; Johnson, Richard N.; and Winslow, Christopher N., 4,204,198, Cl. 340-347.0AD.
Johnson, Robert E.: *See*—
Hollier, Thomas R.; and Johnson, Robert E., 4,203,266, Cl. 52-116.000.
Johnsson, M. K. Olof; Oberg, Karl-Erik; and Bertheussen, Harry, to Scandinavian Lancers Aktiebolag. Method of manufacturing a lead alloy steel and a steel made according to the method. 4,203,763, Cl. 75-129.000.
Jones Medical Instrument Company: *See*—
Jones, William C., 4,203,316, Cl. 73-3.000.
Jones, Robert J.; O'Rell, Michael K.; and Hom, Jim M., to TRW Inc. Fluorinated aromatic diamine. 4,203,922, Cl. 260-570.00R.
Jones, William C., to Jones Medical Instrument Company. Device and method for calibrating pulmonary function testing equipment. 4,203,316, Cl. 73-3.000.
Joosten, Joannes J. W. M., to Oce-van der Grinten N.V. Device for copying sheetlike originals. 4,203,588, Cl. 271-246.000.
Jordan College: *See*—
Coxon, DeWayne; and Gates, Timothy P., 4,203,424, Cl. 126-422.000.
Josef Gartner & Co., Firma: *See*—
Gartner, Karl, 4,203,487, Cl. 165-50.000.
Jouet, Etienne, to Spirec l'Echangeur Spirale Ever Clean. Method and apparatus for the manufacture of a heat exchanger. 4,203,205, Cl. 29-727.000.
Joullie, Maurice; Maillard, Gabriel; Lakah, Lucien; Warolin, Christian J. M.; and Pascal, Yves R. A., to Metabio-Joullie. M-Trifluoromethylphenyl-piperazine. 4,203,986, Cl. 424-250.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Kondo, Kenichi; and Komaki, Shojiro, 4,203,278, Cl. 368-73.000.
Yagi, Kenjiro; and Hirai, Hirotomo, 4,204,205, Cl. 340-719.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Uehara, Kazuo, 4,203,712, Cl. 417-218.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Usui, Kiyofumi; Otsuki, Chihiro; and Inukai, Sadaharu, 4,204,180, Cl. 335-205.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Yamada, Senichi; and Kato, Yoshio, 4,203,782, Cl. 148-12.00E.
Kaczkowski, Bernard C.: *See*—
Baumann, Frederick W.; and Kaczkowski, Bernard C., 4,203,483, Cl. 164-116.000.
Kaetzel, Pierre, to Samibem, S.A. Forkless haymaking machine. 4,203,277, Cl. 56-377.000.
Kage, Kouzou, to Nippon Electric Co., Ltd. Noise detector circuit. 4,204,164, Cl. 455-135.000.
Kage, Kouzou, to Nippon Electric Co., Ltd. Impulse noise limiter circuit. 4,204,170, Cl. 328-165.000.
Kahn, Henry; and Libit, Sidney M., to Kahn, Henry. Dental cap package. 4,203,515, Cl. 206-63.500.
Kaiser, Mark E., to Dow Chemical Company, The. Process for preparing 2-oxazolines. 4,203,900, Cl. 548-239.000.
Kaizerman, Samuel: *See*—
Chang, Eugene Y. C.; and Kaizerman, Samuel, 4,203,889, Cl. 260-45.8NT.
Kajiwara, Yuji: *See*—
Ohkubo, Toshio; Kajiwara, Yuji; and Itano, Tsutomu, 4,204,107, Cl. 219-216.000.
Kakuhashi, Takeshi; and Miyake, Yasufumi, to Nitto Electric Industrial Co., Ltd. Printed circuit substrate with resistance elements. 4,204,187, Cl. 338-307.000.
Kali-Chemie Aktiengesellschaft: *See*—
Simoleit, Hartmut; and Walter, Ludwig, 4,203,953, Cl. 423-243.000.
Kalinichenko, Anatoly Y., to Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia. Digital control device for d.c. thyristor-pulse converter. 4,204,267, Cl. 363-85.000.
Kalopissis, Gregoire, to L'Oreal. Sulfur containing heterocyclic amino acid derivatives. 4,204,064, Cl. 546-245.000.
Kaman, Charles H.: *See*—
Hitz, George E.; Kaman, Charles H.; Mudge, Craig; O'Loughlin, James F.; and Sullivan, Daniel T., 4,204,252, Cl. 364-200.000.
Kaminsky, Walter: *See*—
Janning, Jorg; Kaminsky, Walter; Sinn, Hansjorg; and Tysarcyk, Stanislav, 4,203,804, Cl. 202-121.000.
Kamiya, Minoru. Timepiece which permits freely adjusting the level of sounds produced therein and given out thereof. 4,203,279, Cl. 368-243.000.

Kamiya, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for preventing turnover of a motorized two-wheeled vehicle. 4,203,500, Cl. 180-219.000.

Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, to Fujisawa Pharmaceutical Company, Limited. Penam derivatives. 4,203,897, Cl. 260-239.100.

Kammiller, Neil; and Paradissis, Pantelis P., to Lorain Products Corporation. Inverter drive circuit. 4,204,266, Cl. 363-98.000.

Kaneko, Yutaka: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kaneko, Yutaka; Masukawa, Toyoaki; and Kawasaki, Mikio, 4,203,767, Cl. 430-376.000.

Kapoor, Ramesh C.: *See*—
Bernstein, Bruce S.; Kapoor, Ramesh C.; and Hyman, Seymour, 4,204,018, Cl. 428-246.000.

Karl, Horst: *See*—
Stemme, Otto; Lermann, Peter; Schrooder, Rolf; and Karl, Horst, 4,203,662, Cl. 354-173.000.

Karmazyn, Michael J.: *See*—
Gladden, Robert S., Jr.; Johnson, Richard J.; Karmazyn, Michael J.; and Tate, Donald L., 4,203,268, Cl. 52-630.000.

Karpat, Arpad: *See*—
Csizy, Tibor; Karpat, Arpad; Melis, Janos; and Szemerey, Zoltan, 4,204,184, Cl. 337-295.000.

Kataoka, Shoei; Sugiyama, Yoshinobu; and Fujisada, Hiroyuki, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Highly sensitive Hall element. 4,204,132, Cl. 307-309.000.

Kataoka, Takeshi; Matsumoto, Hiroshi; and Matsui, Hisashi, to Ono Seiko Co., Ltd. Mechanism for changing inductance of a push-button tuner. 4,204,179, Cl. 334-7.000.

Kato, Minoru: *See*—
Fujii, Hideo; and Kato, Minoru, 4,203,403, Cl. 123-148.0AC.

Kato, Toshiro: *See*—
Funaki, Yuji; Oshita, Hirofumi; Tanaka, Shizuya; Yamamoto, Shigeo; and Kato, Toshiro, 4,203,995, Cl. 424-273.00R.

Kato, Yoshio: *See*—
Yamada, Senichi; and Kato, Yoshio, 4,203,782, Cl. 148-12.00E.

Katsuyama, Toshio: *See*—
Suganuma, Tsuneo; Ishida, Koji; Satoh, Shin; Sugie, Mamoru; Katsuyama, Toshio; and Toda, Gyozo, 4,203,743, Cl. 65-3.00A.

Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,204,181, Cl. 336-96.000.

Kaufmann, Raimund: *See*—
Aberle, Lothar; Bank, Walter; Hillenkamp, Franz; Kaufmann, Raimund; Nitsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,204,117, Cl. 250-287.000.

Kawada, Hirohito: *See*—
Arii, Hiroshi; Kawada, Hirohito; Yoshida, Takashi; and Nonaka, Chiaki, 4,204,246, Cl. 361-385.000.

Kawakita, Kenji: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,203,899, Cl. 548-194.000.

Kawamoto, Hiromi: *See*—
Enomoto, Takamitsu; Tanaka, Kyoji; Kawamoto, Hiromi; Mizuno, Tamotsu; and Fujinaga, Masao, 4,203,955, Cl. 423-308.000.

Kawasaki, Mikio: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kaneko, Yutaka; Masukawa, Toyoaki; and Kawasaki, Mikio, 4,203,767, Cl. 430-376.000.

Kegel, Werner. Apparatus for monitoring and indicating the onset of parturition. 4,203,450, Cl. 128-630.000.

Kegg, Geoffrey E.: *See*—
Kegg, Jack P.; Fuller, Colin A.; and Kegg, Geoffrey E., 4,203,177, Cl. 16-24.000.

Kegg, Jack P.; Fuller, Colin A.; and Kegg, Geoffrey E. Castor. 4,203,177, Cl. 16-24.000.

Keiper Automobiltechnik GmbH & Co KG: *See*—
Cremer, Heinz P., 4,204,255, Cl. 364-425.000.

Keller, John W., Jr.; Digby, Dennis; and Coombes, Alan, to Biotronik Mess- und Therapiegerate GmbH & Co. Security maintenance for programmable pacer reprogramming. 4,203,447, Cl. 128-419.0PG.

Keller, John W., Jr., to Biotronik Mess- und Therapiegerate GmbH & Co. Programmably variable voltage multiplier for implanted stimulator. 4,203,448, Cl. 128-419.0PG.

Kelley, John H.: *See*—
Getson, Edward F., Jr.; Kelley, John H.; McLaughlin, Albert T.; and Rathbun, Donald J., 4,204,250, Cl. 364-200.000.

Kelly, Robert C., to Upjohn Company, The. 9-Deoxy-6,9α-epoxymethano-PG C-1 amines. 4,204,057, Cl. 542-426.000.

Kelso, Robert G.: *See*—
Garner, James W.; and Kelso, Robert G., 4,203,875, Cl. 260-13.000.

Kemp, Robert: *See*—
Bailey, Wayne; and Kemp, Robert, 4,203,731, Cl. 48-99.000.

Kendall Company, The: *See*—
Witt, Edward, 4,204,023, Cl. 428-355.000.

Kerigan, Shaun C.: *See*—
Key, Brian D.; Smith, James; and Kerigan, Shaun C., 4,204,089, Cl. 178-30.000.

Kerman, Kenneth C. Combination air filter and vacuum cleaning system. 4,203,738, Cl. 55-287.000.

Kernforschungsanlage Julich Gesellschaft mit Beschrankter Haftung: *See*—
Stoeppler, Markus; and Havezov, Ivan, 4,203,840, Cl. 210-83.000.

Keszthelyi Agrartudomanyi Egyetem: *See*—
Aradi, Emil; Blickle, Tibor; Monostori, Endre; Nemeth, Jeno; Pallai, Ivanne; and Varga, Janos, 4,203,228, Cl. 34-10.000.

Ketley, Arthur D.: *See*—
Kramm, David E.; and Ketley, Arthur D., 4,204,010, Cl. 427-44.000.

Key, Brian D.; Smith, James; and Kerigan, Shaun C., to International Business Machines Corporation. Keyboard method and apparatus for accented characters. 4,204,089, Cl. 178-30.000.

Keyes, Melvin H., to Technicon Instruments Corporation. Copolymerization of proteins on an inorganic support. 4,204,040, Cl. 435-176.000.

Kidd, Dennis E.: *See*—
Schwartz, Harold O.; and Kidd, Dennis E., 4,203,337, Cl. 84-1.010.

Kiefer, Werner; Krause, Dieter; Scheidler, Herwig; Schulze, Hans-Wilhelm; and Kristen, Klaus, to JENAer Glaswerk, Schott. Fireproof building element. 4,203,264, Cl. 52-1.000.

Kiehs, Karl; and Adolphi, Heinrich. Phosphoric acid esters, composition and use. 4,203,977, Cl. 424-211.000.

Kienzle, Frank, to Hoffmann-La Roche Inc. Process for producing carotenoids. 4,204,073, Cl. 560-231.000.

Kim, Sunyong P. Miniature flashlight unit. 4,204,272, Cl. 362-200.000.

Kimball International, Inc.: *See*—
Welsh, Alan B.; and Robinson, John W., 4,203,339, Cl. 84-1.190.

Kindermann, Wolfgang: *See*—
Egener, Ernst-Gunter; and Kindermann, Wolfgang, 4,203,471, Cl. 137-637.000.

King, James L.: *See*—
Clifton, Jerry L.; Gentile, Ralph; Hurlbut, Russell G.; and King, James L., 4,203,664, Cl. 355-64.000.

King, Nigel J. R., to Racal Communications Equipment Limited. Phase locked loop variable frequency generator. 4,204,174, Cl. 331-10.000.

King, Randall N., to Electric Power Research Institute, Inc. Sodium insert container for a sodium-sulfur cell and its method of use. 4,204,035, Cl. 429-104.000.

Kingsley, Charles A.; Spaulding, James R.; and Gifford, William E., to General Motors Corporation. Evaporative emissions canister. 4,203,401, Cl. 123-136.000.

Kinjo, Yasuo: *See*—
Ichise, Wataru; Kinjo, Yasuo; Enokida, Kenji; and Nihei, Hideharu, 4,203,860, Cl. 252-181.200.

Kinomura, Sigeru: *See*—
Suzuki, Hiroshi; Ito, Yukio; Yasumoto, Yosiro; Kinomura, Sigeru; and Nagashima, Kazuo, 4,203,873, Cl. 252-545.000.

Kinoshita, Hiroyuki, to Tokyo Shibaura Electric Co., Ltd. Dynamic read-write random access memory. 4,204,277, Cl. 365-203.000.

Kinyon, Joann M.: *See*—
Harris, Delbert L.; Goodnow, Robert A.; Glock, Robert D.; and Kinyon, Joann M., 4,203,968, Cl. 424-92.000.

Kiralfy, Dennis: *See*—
Gast, Uwe; Kiralfy, Dennis; Schaefer, Klaus; Slawik, Eckhard; and Wellendorf, Klaus, 4,204,223, Cl. 358-80.000.

Kirchoff, George F.; and Schneiter, Fred E., to Thiokol Corporation. Pelletizable, rapid and cool burning solid nitrogen gas generant. 4,203,787, Cl. 149-35.000.

Kirchweger, Karl: *See*—
Fachbach, Heinz; Thien, Gerhard; and Kirchweger, Karl, 4,203,407, Cl. 123-198.00E.

Kirn, William A.; and Gehman, David R., to Rohm and Haas Company. Solubilized acrylic polymers and carpet shampoos containing the same. 4,203,859, Cl. 252-174.230.

Kirsch, Wilhelm: *See*—
Krull, Manfred; Buchwald, Holger; and Kirsch, Wilhelm, 4,203,435, Cl. 128-156.000.

Kishi, Hirotoshi; Hattori, Hiroyuki; and Shimizu, Katsuichi, to Canon Kabushiki Kaisha. Sheet sorter device. 4,203,587, Cl. 271-293.000.

Kishibayashi, Tetsuo: *See*—
Takamizawa, Minoru; Abe, Akira; Ono, Yoshiaki; Sugimori, Yutaka; Kishibayashi, Tetsuo; and Ino, Makoto, 4,204,030, Cl. 428-447.000.

Kita, Yasuhiro: *See*—
Takasaki, Yoshitaka; Kita, Yasuhiro; Nakagawa, Junichi; and Ishizuka, Kohei, 4,204,176, Cl. 333-28.00R.

Kitchener, Brian L.: *See*—
Telling, Ronald C.; Passingham, Roy J.; Kitchener, Brian L.; and Hopkinson, David G., 4,203,801, Cl. 435-284.000.

Kitcher, James R.; Ozols, Gunars M.; and Zingerman, Bryant N., to International Business Machines Corporation. Reactive ion etching process for metals. 4,203,800, Cl. 156-643.000.

Kiwak, Robert S.; and Liu, Tung, to Bendix Corporation, The. Water slurry process for manufacturing phenolic resin bonded friction materials. 4,203,936, Cl. 264-26.000.

Kiyota, Fumio: *See*—
Takemura, Kazutoshi; Oda, Takashi; and Kiyota, Fumio, 4,204,031, Cl. 428-539.500.

Kjellander, Jan O.; and Danielsson, Dan G., to Orion-Yhtyma Oy. Device for examining microorganisms. 4,204,045, Cl. 435-301.000.

Kjohl, Olav: *See*—
Elstrom, Tore, deceased; Gustavsen, Per F.; and Kjohl, Olav, 4,204,053, Cl. 528-259.000.

Klauke, Guenter: *See*—
Reichel, Hilmar; Klauke, Guenter; Herting, Karl-Heinz; and Pointner, Martin, 4,203,531, Cl. 228-1.00A.

Klezl, Peter, to OMV Aktiengesellschaft. Pointing compound. 4,203,881, Cl. 260-28.50A.

Klischat, Ditmar: *See—*
Sehlbach, Gerd; and Klischat, Ditmar, 4,203,306, Cl. 64-23.000.
Klokner-Werke Aktiengesellschaft: *See—*
Bahre, Karl; and Krohm, Reinhold, 4,203,557, Cl. 241-186.00R.
Klotzner, Winfried, to Robert Bosch GmbH. Input-output unit for a microprocessor engine control system. 4,204,256, Cl. 364-431.000.
Kmak, Walter S.; and Monzo, Charles, to Exxon Research & Engineering Co. Method for removing coronene from heat exchangers. 4,203,825, Cl. 208-48.00R.
Knapp, Edward J., Jr., to Gould Inc. Indicating or striker pin for electric fuses. 4,204,182, Cl. 337-244.000.
Knight, Lindsay C.; and Casey, Roy E., to Australasian Training Aids Pty. Ltd. Night effects simulator. 4,203,232, Cl. 35-25.000.
Kniskern, Peter J.: *See—*
Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., 4,203,970, Cl. 424-92.000.
Knoebel, Paul S.; and Wennerstrom, Jerald M., to Babcock & Wilcox Company, The. Fluidized bed fuel feeder. 4,203,391, Cl. 122-4.00D.
Knoll International, Inc.: *See—*
Hopkins, Richard B., 4,203,624, Cl. 297-162.000.
Knopp, Arthur A.; Nash, John E.; and Lewis, Richard P., to Syntex (U.S.A.) Inc. Gas-driven handpiece having vibration isolating means. 4,203,221, Cl. 433-117.000.
Knotik, Karl; Leichter, Peter; Proksch, Emil; and Huschka, Hans, to Nukem GmbH. Process for the production of solid particles. 4,203,863, Cl. 252-301.10W.
Kobayashi, Yasuhisa: *See—*
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Kobylinski, Thaddeus P.: *See—*
Wu, Ching-Yong; and Kobylinski, Thaddeus P., 4,203,926, Cl. 568-319.000.
Koch, Edward G. Male therapeutic device. 4,203,432, Cl. 128-79.000.
Kochs Adler AG: *See—*
Ludwig, Rolf, 4,203,377, Cl. 112-58.000.
Kodama, Masayuki, to Fugi Jukogyo Kabushiki Kaisha. Transmission apparatus for motor vehicle. 4,203,498, Cl. 180-70.0MS.
Koeller, Paul, to Dominion Engineering Works Limited. Hydraulic turbo machine wicket gate seals. 4,203,703, Cl. 415-113.000.
Kohler, George O.: *See—*
Saunders, Robert M.; and Kohler, George O., 4,204,008, Cl. 426-583.000.
Koinuma, Tokuju; and Tashiro, Norio, to Tokyo Shibaura Electric Co., Ltd. Permanent magnet-containing magnetron. 4,204,138, Cl. 315-39.510.
Kojima, Tadashi; and Seki, Kazuo, to Honeywell Inc. Flame detection thermocouple. 4,203,779, Cl. 136-233.000.
Komaki, Shojiro: *See—*
Kondo, Kenichi; and Komaki, Shojiro, 4,203,278, Cl. 368-73.000.
Kompis, Ivan; and Wick, Alexander E., to Hoffmann-La Roche Inc. Benzylpyrimidine derivatives. 4,203,980, Cl. 424-229.000.
Kondo, Hideyo: *See—*
Tosaka, Umi; Kondo, Hideyo; Murai, Keiichi; and Toma, Hitoshi, 4,203,764, Cl. 430-67.000.
Kondo, Kenichi; and Komaki, Shojiro, to Kabushiki Kaisha Daini Seikosha. Alarm electronic timepiece. 4,203,278, Cl. 368-73.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Kaneko, Yutaka; Masukawa, Toyoaki; and Kawasaki, Mikio, 4,203,767, Cl. 430-376.000.
Kono, Teruhisa, to Sumitomo Electric Industries, Ltd. Parallel proportioning valve for use in a dual braking system. 4,203,627, Cl. 303-6.00C.
Konta, Yukio, to Tomy Kogyo Co., Inc. Pinball flipper mechanism. 4,203,603, Cl. 273-129.00W.
Konz, Elmar; and Pistorius, Rudolf, to Hoechst Aktiengesellschaft. Hydroquinone dimethyl ether. 4,204,076, Cl. 568-648.000.
Koppel, Gary A.; and Cooper, Robin D. G., to Eli Lilly and Company. Acetoxy azetidin-2-one antibiotics via thiazolidine ring cleavage. 4,203,896, Cl. 260-239.00A.
Koppel, Mikhail A.: *See—*
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,203,688, Cl. 406-85.000.
Koster, William H.: *See—*
Gordon, Eric M.; and Koster, William H., 4,203,992, Cl. 424-271.000.
Kowalski, Gunter, to U.S. Philips Corporation. Device for measuring radiation absorption in a three-dimensional object. 4,204,124, Cl. 250-445.00T.
Koyo Jidoki Corporation Ltd.: *See—*
Yamashita, Kyoichi, 4,203,798, Cl. 156-567.000.
Kraftwerk Union Aktiengesellschaft: *See—*
Egener, Ernst-Gunter; and Kindermann, Wolfgang, 4,203,471, Cl. 137-637.000.
Fritz, Werner; and Weghaupt, Erich, 4,204,134, Cl. 310-52.000.
Kral, Fred G., to Mattel, Inc. Ball bumper. 4,203,602, Cl. 273-121.00A.
Kramm, David E.; and Ketley, Arthur D., to W. R. Grace & Co. Radiation curable, ethylenically unsaturated thixotropic agent and method of preparation. 4,204,010, Cl. 427-44.000.
Krause, Dieter: *See—*
Kiefer, Werner; Krause, Dieter; Scheidler, Herwig; Schulze, Hans-Wilhelm; and Kristen, Klaus, 4,203,264, Cl. 52-1.000.
Kraxner, Istvan; Sebok, Antal; Steiner, Janos; and Toth, Jozsef, to Aluminiumpari Tervezo es Kutato Intezet. Self-adjusting power distributor. 4,203,689, Cl. 406-123.000.
Krebs Engineers: *See—*
Martin, David L., 4,203,834, Cl. 209-211.000.
Krieger, Wilfried: *See—*
Ahlgrim, Michael; Mietens, Gerhard; Krieger, Wilfried; and Sorbe, Gunter, 4,203,637, Cl. 339-5.00R.
Kristen, Klaus: *See—*
Kiefer, Werner; Krause, Dieter; Scheidler, Herwig; Schulze, Hans-Wilhelm; and Kristen, Klaus, 4,203,264, Cl. 52-1.000.
Krohm, Reinhold: *See—*
Bahre, Karl; and Krohm, Reinhold, 4,203,557, Cl. 241-186.00R.
Krolak, Ronald F.; and Warywoda, Joseph, to Bunker Ramo Corporation. Electrical ribbon connector and hood. 4,203,643, Cl. 339-107.000.
Krosnick, Teresa A. Musical education toy. 4,203,344, Cl. 84-470.00R.
Kruger, Robert A.: *See—*
Mistretta, Charles A.; Kruger, Robert A.; and Houk, Theodore L., 4,204,226, Cl. 358-111.000.
Krull, Manfred; Buchwald, Holger; and Kirsch, Wilhelm, to Carl Freudenberg, Firma. Wound dressing. 4,203,435, Cl. 128-156.000.
Krumm, Hagen: *See—*
Supp, Emil; Jockel, Heinz; Krumm, Hagen; and Marschner, Friedemann, 4,203,915, Cl. 260-449.500.
Kruper, Andrew P., to Westinghouse Electric Corp. Adjustable time delay relay. 4,204,128, Cl. 307-141.000.
Krylov, Nikolai I.; Toder, Ilya A.; Sidorov, Oleg F.; Tarabaev, Gennady I.; and Pinsky, Gennady I. Mill stand roll assembly. 4,203,310, Cl. 72-247.000.
Krysiak, William J.; and Moyer, Richard L., to Betz Laboratories, Inc. Grinding device. 4,203,556, Cl. 241-86.100.
Kubota Tekko Kabushiki Kaisha: *See—*
Shimizu, Koh; Uchimura, Terumi; Uede, Ken-Ichi; and Nakamura, Katuyoshi, 4,203,838, Cl. 210-63.00R.
Kudlich, Hans: *See—*
Zimmer, Peter; Kudlich, Hans; Schweitzer, Karl; and Mayr, Walter, 4,203,554, Cl. 239-585.000.
Kudo, Shiro; and Hayashi, Mitsuyoshi, to Asahimatsu Koridofu Kabushiki Kaisha. Process for producing fibrous food materials. 4,204,005, Cl. 426-518.000.
Kufner Textilwerke KG: *See—*
Hefele, Josef, 4,204,017, Cl. 428-160.000.
Kuhlthau, Hans-Peter: *See—*
Brack, Alfred; and Kuhlthau, Hans-Peter, 4,203,722, Cl. 8-467.000.
Kuhn, Weldon R.: *See—*
Enters, Edward W.; and Kuhn, Weldon R., 4,203,237, Cl. 37-43.00E.
Kulite Semiconductor Products, Inc.: *See—*
Kurtz, Anthony D.; and Weber, Richard A., 4,204,185, Cl. 338-4.000.
Kunde, Joachim: *See—*
Matthies, Paul; Kunde, Joachim; and Hoerauf, Werner, 4,204,049, Cl. 526-65.000.
Kunz, Barton H.; Shlatz, Myron F.; and Spears, Jesse W., to International Business Machines Corporation. Document feed for a copier machine. 4,203,585, Cl. 271-4.000.
Kunz, Raymond W., to Clairol Incorporated. Hair dryer with compactable bonnet. 4,203,230, Cl. 34-99.000.
Kunze, Dieter, to Jean Walterscheid GmbH. Adjusting device for the draft link of a three-point mounting device. 4,203,613, Cl. 280-460.00A.
Kunzli, Roland; Melton, Keith; and Mercier, Olivier, to BBC Brown, Boveri & Company, Limited. Method and apparatus for the expansion of a hollow article. 4,203,313, Cl. 72-364.000.
Kupers, Walter; and Della Mura, Pasquale, to Merck Patent Gesellschaft mit beschrankter Haftung. Directly-pressable ascorbic acid-containing granulates. 4,203,997, Cl. 424-280.000.
Kuraray Company, Limited: *See—*
Minatono, Shobu; Takamatsu, Hideo; Yamauchi, Junnosuke; and Terao, Katsuyoshi, 4,204,046, Cl. 525-65.000.
Kurashiki Boseki Kabushiki Kaisha: *See—*
Tanabe, Naoto; Okada, Kenzoh; and Maeda, Norio, 4,204,011, Cl. 427-57.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Murayama, Naohiro, 4,204,135, Cl. 310-357.000.
Kurer, Peter F., to Pinnockchoice Limited. Attachment of tooth crowns. 4,203,217, Cl. 433-220.000.
Kuroki, Hisataka: *See—*
Hirai, Akira; Nishimoto, Kazuyuki; and Kuroki, Hisataka, 4,203,886, Cl. 260-37.0SB.
Kuroki, Katsuro; and Tanaka, Osamu, to Nippon Steel Corporation. Grain oriented electromagnetic steel sheet. 4,203,784, Cl. 148-111.000.
Kurtz, Anthony D.; and Weber, Richard A., to Kulite Semiconductor Products, Inc. Integral transducer assemblies employing thin homogeneous diaphragms. 4,204,185, Cl. 338-4.000.
Kurtz, Walter; and Dehnert, Johannes, to BASF Aktiengesellschaft. Azo dyes containing sulfonic acid groups and oxdiazolyl radicals. 4,203,894, Cl. 260-156.000.
Kurygina, Dina V.: *See—*
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

Kuylenstierna, Ulf V.: *See*—
Reinhardt, Hans; and Kuylenstierna, Ulf V., 4,203,964, Cl. 423-658.500.
Kuzyko, Igor S.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.
Laboratorios Made, S.A.: *See*—
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; and Fernandez de Gamboa, Cristina R., 4,204,063, Cl. 546-99.000.
LaChance, Ernest J., Sr. Novel secure cap with depressible lock. 4,203,527, Cl. 220-253.000.
Lachman, Irwin M.: *See*—
Davis, Allen D., Jr.; Johns, Herbert L.; and Lachman, Irwin M., 4,203,772, Cl. 106-40.00R.
La Grange, Mark. Golf game. 4,203,604, Cl. 273-176.0FB.
Laine, Jean-Claude, to Saint-Gobain Industries. Method of pressing and pressing machine for hollow glassware. 4,203,749, Cl. 65-68.000.
Laitram Corporation, The: *See*—
Lapeyre, James M., 4,203,302, Cl. 62-259.000.
Lakah, Lucien: *See*—
Joullie, Maurice; Maillard, Gabriel; Lakah, Lucien; Warolin, Christian J. M.; and Pascal, Yves R. A., 4,203,986, Cl. 424-250.000.
Laleman, Charles. Use of blood in the cement, mortar and concrete industry for obtaining a lightened material. 4,203,674, Cl. 366-2.000.
Lambertson, Theodore C. Metal tub made from flat metal sheets. 4,203,379, Cl. 113-120.00B.
Lamonte, Oliverio M.: *See*—
Bauer, William V.; Isaacs, Jose A. C.; and Lamonte, Oliverio M., 4,203,960, Cl. 423-461.000.
Lane, Don W. Bidirectional presettable odometer. 4,204,112, Cl. 235-95.00R.
Lang, Raimund: *See*—
Buken, Gunther; and Lang, Raimund, 4,204,224, Cl. 358-107.000.
Langhorst, Winfield S., to Bethlehem Steel Corporation. Multiple strand tower guy assembly. 4,203,267, Cl. 52-148.000.
Lankheet, Jay A. Vinyl liner and sealing groove assembly for pools. 4,203,170, Cl. 4-172.000.
Lapeyre, James M., to Laitram Corporation, The. Floor mounted air conditioner. 4,203,302, Cl. 62-259.000.
Lapointe, Michel: *See*—
Collin, Maurice; Lapointe, Michel; and Collin, Andre, 4,203,345, Cl. 84-478.000.
Laporte Industries Limited: *See*—
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,203,861, Cl. 252-182.100.
Larrabee, Robert D., to RCA Corporation. Power transfer apparatus. 4,204,147, Cl. 323-4.000.
Larsson, Tore I., to Tetra Pak International AB. Arrangement for joining material webs. 4,203,796, Cl. 156-504.000.
Lascelles, Alan: *See*—
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Laser Systems, Inc.: *See*—
Boulais, Richard A., 4,203,665, Cl. 356-4.000.
Laudon, Monique: *See*—
Bugaut, Andree; and Laudon, Monique, 4,204,059, Cl. 544-166.000.
Laurent, Jean: *See*—
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,203,501, Cl. 181-120.000.
Lautenschlager, Eugene P.; Robinson, Peter J.; and Vitek, Randall M., to Northwestern University. Periodontal probe. 4,203,223, Cl. 433-75.000.
Leavitt, Clyde M.: *See*—
Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., 4,203,504, Cl. 182-10.000.
LeBlanc, Leo J. Process for producing core or mold parts from sand. 4,203,482, Cl. 164-12.000.
Lechler, Gerhard. Apparatus for measuring bearing forces. 4,203,319, Cl. 73-141.00A.
Leclerc, Jean-Francois; and Waegaert, Pierre, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Process for the repetitive and optimalized layout of shapes having the determined contour of a cigar wrapper within each of the elements of a series of tobacco leaves. 4,203,453, Cl. 131-20.00R.
Lee, Gim F., Jr., to General Electric Company. Flame retardant thermoplastic polyphenylene ether resin compositions. 4,203,931, Cl. 525-4.000.
Leet, Henry P.: *See*—
Pierce, Russell W.; Teppo, Edward A.; and Leet, Henry P., 4,203,667, Cl. 356-152.000.
LeGrand, Donald G.; and Vitale, Gina G., to General Electric Company. Glass-polycarbonate laminate. 4,204,025, Cl. 428-409.000.
Le Grand, Donald G.; and Vitale, Gina G., to General Electric Company. Glass-polycarbonate laminates. 4,204,026, Cl. 428-409.000.
Leichter, Peter: *See*—
Knotik, Karl; Leichter, Peter; Proksch, Emil; and Huschka, Hans, 4,203,863, Cl. 252-301.10W.
LeMay, Robert C.: *See*—
Rose, Robert N., 4,203,761, Cl. 75-40.000.
Lenssen, Walter: *See*—
Boettger, Friedrich; Eugster, Walter; Lenssen, Walter; and Missmahl, Bodo, 4,203,336, Cl. 83-550.000.
Lequeux, Christian; and Chapuis, Henri. Device for mechanically protecting the annular edge of a tube. 4,203,474, Cl. 138-96.00R.
Lermann, Peter: *See*—
Stemme, Otto; Lermann, Peter; Schrooder, Rolf; and Karl, Horst, 4,203,662, Cl. 354-173.000.
Les Cables de Lyon: *See*—
Millet, Christian; and Gauthier, Francis, 4,203,650, Cl. 350-96.210.
Lesas, Claude H.; and Pierre, Michel, to S. A. Beghin-Say. Paper structures containing improved cross-linked cellulose fibers. 4,204,054, Cl. 536-56.000.
Lesas, Claude H.; and Pierre, Michel, to S. A. Beghin-Say. Cross-linked cellulose fibers. 4,204,055, Cl. 536-56.000.
Lester, William M. Dispensing closure for a squeezable container. 4,203,536, Cl. 222-495.000.
Leva, Jean: *See*—
Dereppe, Michel; and Leva, Jean, 4,203,876, Cl. 260-17.40R.
Leva, Max. Tower packing element. 4,203,934, Cl. 261-98.000.
Leveckis, Algis S.; and Gelman, Stephanie S., to Procter & Gamble Company, The. Microwave energy moderating bag. 4,204,105, Cl. 219-10.55E.
Levi Strauss & Co.: *See*—
Blessing, Hubert, 4,203,590, Cl. 271-265.000.
Levine, Robert A.: *See*—
Wardlaw, Stephen C.; and Levine, Robert A., 4,204,015, Cl. 428-34.000.
Levine, Stewart A. Apparatus for producing a pulsating spray of water. 4,203,551, Cl. 239-195.000.
Levitt, Joseph: *See*—
Schwartz, Jerome; and Levitt, Joseph, 4,203,693, Cl. 409-81.000.
Lewandowski, Joseph T.: *See*—
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,203,871, Cl. 252-518.000.
Lewis, Donald J.: *See*—
Corey, Kenneth J., 4,203,475, Cl. 138-109.000.
Lewis, Richard P.: *See*—
Knopp, Arthur A.; Nash, John E.; and Lewis, Richard P., 4,203,221, Cl. 433-117.000.
Leybold-Heraeus GmbH: *See*—
Aberle, Lothar; Bank, Walter; Hillenkamp, Franz; Kaufmann, Raimund; Nitsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,204,117, Cl. 250-287.000.
Libit, Sidney M.: *See*—
Kahn, Henry; and Libit, Sidney M., 4,203,515, Cl. 206-63.500.
Liebal, Eberhard; and Eichenberg, Norbert, to Messrs. J. Walter Co. Maschinen GmbH. Turret glass press. 4,203,753, Cl. 65-163.000.
Liebig, Reinhard: *See*—
Jahrig, Siegfried; and Liebig, Reinhard, 4,204,103, Cl. 200-153.0SC.
Lin, Kou C.; and Woods, Edmund E., to Westinghouse Electric Corp. Adhesive coated electrical conductors. 4,204,087, Cl. 174-120.0SR.
Lindberg, Gunnar V. Tray unloading device. 4,203,696, Cl. 414-331.000.
Lindner, Werner: *See*—
Cramer, Jurgen; and Lindner, Werner, 4,203,821, Cl. 204-268.000.
Lingl Corporation: *See*—
Lingl, Hans, 4,203,937, Cl. 264-101.000.
Lingl, Hans, to Lingl Corporation. Process and apparatus for the manufacture of prefabricated lined wall sections. 4,203,937, Cl. 264-101.000.
Lipman, Kenneth, to United Technologies Corporation. Harmonic cancellation for multi-bridge, three-phase converters. 4,204,264, Cl. 363-71.000.
Lippman, Alfred, to Toth Aluminum Corporation. Process for consolidation of fine alumina particles. 4,203,962, Cl. 423-625.000.
List, Hans: *See*—
Fachbach, Heinz; Thien, Gerhard; and Kirchweger, Karl, 4,203,407, Cl. 123-198.00E.
Fachbach, Heinz; Thien, Gerhard; and Meurer, Peter C., 4,203,409, Cl. 123-198.00E.
Freyn, Fritz, 4,203,402, Cl. 123-139.0AW.
Liu, Tung: *See*—
Kiwak, Robert S.; and Liu, Tung, 4,203,936, Cl. 264-26.000.
Liu, Yung-Ho. Electronic time piece automatic calibrating device. 4,204,167, Cl. 455-231.000.
Locatelli, Renato: *See*—
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, 4,203,882, Cl. 260-28.50A.
Loffland Brothers Company: *See*—
Johnson, Earl R., 4,203,575, Cl. 254-88.000.
Long, Leonard L. Air travel insurance assemblage and method of validating. 4,203,620, Cl. 283-23.000.
Longo, John M.: *See*—
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,203,871, Cl. 252-518.000.
Lopez, Manuel A., to Technoresinas Espanola, S.A. Device for converting a uniform circular movement into a variable or uniform longitudinal movement. 4,203,329, Cl. 74-39.200.
Lorain Products Corporation: *See*—
Kammiller, Neil; and Paradissis, Pantelis P., 4,204,266, Cl. 363-98.000.
Lord, Thomas J., to United Aircraft Products, Inc. Air inlet control for aircraft or the like. 4,203,566, Cl. 244-57.000.
L'Oreal: *See*—
Bugaut, Andree; and Laudon, Monique, 4,204,059, Cl. 544-166.000.

Goncalves, Antonin, 4,203,172, Cl. 4-231.000.
Kalopissis, Gregoire, 4,204,064, Cl. 546-245.000.
Lorenz, Donald H.: *See*—
Gruber, Bruce A.; and Lorenz, Donald H., 4,203,919, Cl. 260-465.00D.
Loshbough, Richard C.; and Pryor, Edward G., to Reliance Electric Company. Digital scale. 4,204,197, Cl. 340-347.0NT.
Lowery, Kirby, Jr.: *See*—
Bressler, Wilbur L.; Lowery, Kirby, Jr.; and Vance, Fred L., Jr., 4,204,050, Cl. 526-97.000.
Lubrizol Corporation, The: *See*—
Steckel, Thomas F., 4,203,855, Cl. 252-42.700.
Lucas Industries Limited: *See*—
Cryer, Edward, 4,204,099, Cl. 200-4.000.
Wiley, David; and Williams, David G., 4,204,190, Cl. 340-52.00A.
Ludeke, Carl A.: *See*—
Glenn, William E., Jr.; and Ludeke, Carl A., 4,203,298, Cl. 62-2.000.
Luderitz, Willi. Wall light fixture, particularly for hospital rooms. 4,204,274, Cl. 362-239.000.
Ludwig, Rolf, to Kochs Adler AG. Sewing of a bead seam with loose thread loops. 4,203,377, Cl. 112-58.000.
Luffau, Gerard: *See*—
Pery, Pierre; Luffau, Gerard; Poulain nee Charley, Joelle; and Petit, Agnes, 4,203,893, Cl. 260-121.000.
Luhrsen, Ernst, to Didier-Werke AG. Refractory spout brick. 4,203,538, Cl. 222-603.000.
Luke, Roger D.; and Rhodes, John M., to Gould Inc. Front trim for panelboard. 4,204,245, Cl. 361-358.000.
Lummus Company, The: *See*—
Bauer, William V.; Isaacs, Jose A. C.; and Lamonte, Oliverio M., 4,203,960, Cl. 423-461.000.
Lunsford, Delbert R.: *See*—
Parrack, Alvin L.; and Lunsford, Delbert R., 4,204,279, Cl. 367-40.000.
Luscan, Bernard; and Reichard, Michel, to Societe Europeenne de Propulsion. Combustion chamber for a ramjet and booster rocket. 4,203,284, Cl. 60-245.000.
Luzzi, John L.: *See*—
Ramey, Chester E.; and Luzzi, John L., 4,203,890, Cl. 260-45.80N.
M&T Chemicals Inc.: *See*—
Stoloff, Alfred; and Williams, Anthony L., 4,203,880, Cl. 260-23.0XA.
M & W Gear Company: *See*—
Fackler, Kenneth C., 4,203,545, Cl. 236-93.00A.
Maag Gear-Wheel & Machine Company Limited: *See*—
Fivian, Daniel A., 4,203,260, Cl. 51-123.00G.
MacDiarmid, Alan G.: *See*—
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Gau, Shek-Chung, 4,204,216, Cl. 357-8.000.
MacDonald, Ian: *See*—
Naslund, Edwin N.; and MacDonald, Ian, 4,203,255, Cl. 49-399.000.
MacLean-Fogg Company: *See*—
Grube, William L., 4,203,187, Cl. 29-283.500.
Madwed, Steven R. Method for silk-screen printing. 4,203,360, Cl. 101-129.000.
Maeda, Norio: *See*—
Tanabe, Naoto; Okada, Kenzoh; and Maeda, Norio, 4,204,011, Cl. 427-57.000.
Maeda, Yoshinobu: *See*—
Narikiyo, Kazuhiko; Itemadani, Eiji; and Maeda, Yoshinobu, 4,203,224, Cl. 33-149.00R.
Maeda, Yoshio; Matsumoto, Koichi; and Nishiwaki, Koji, to Hitachi, Ltd. Wavelength reading apparatus for monochromator. 4,203,669, Cl. 356-332.000.
Mageli, Orville L.: *See*—
Bafford, Richard A.; and Mageli, Orville L., 4,204,075, Cl. 568-562.000.
Magneville, Pierre: *See*—
Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,203,501, Cl. 181-120.000.
Maillard, Gabriel: *See*—
Joullie, Maurice; Maillard, Gabriel; Lakah, Lucien; Warolin, Christian J. M.; and Pascal, Yves R. A., 4,203,986, Cl. 424-250.000.
Major, Emery: *See*—
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Makarov, Viktor B.: *See*—
Ermakov, Vladimir E.; Makarov, Viktor B.; Seidaliev, Fikrat S. O.; Nikiforov, Alexandr M.; Bushev, Alexandr V.; and Dozortsev, July K., 4,203,309, Cl. 72-96.000.
Makela, Martin A., to J-Mark, Inc. Running board for light trucks. 4,203,611, Cl. 280-163.000.
Malek, Jack H.; and Siegel, Herman M., to CBS Inc. Toy ball with gear-driven figure. 4,203,251, Cl. 46-107.000.
Malerbi, Bernard W.: *See*—
Hydes, Paul C.; and Malerbi, Bernard W., 4,203,912, Cl. 260-429.00R.
Malmadie & Co. Maschinenfabrik GmbH: *See*—
Boettger, Friedrich; Eugster, Walter; Lenssen, Walter; and Missmahl, Bodo, 4,203,336, Cl. 83-550.000.
Mamine, Takayoshi: *See*—
Matsushita, Takeshi; Mamine, Takayoshi; Hayashi, Hisao; and Nishiyama, Kazuo, 4,203,780, Cl. 148-1.500.
Manufacture Metallurgique de Tournus: *See*—
Vaussanvin, Marcel, 4,203,357, Cl. 99-340.000.
Manz, David F.: *See*—
Frank, William R.; and Manz, David F., 4,203,618, Cl. 280-804.000.
Mar, Bob. Safety containers. 4,203,532, Cl. 222-153.000.
Marcal Paper Mills, Inc.: *See*—
Smaw, Jesse B., 4,203,584, Cl. 270-40.000.
Marcel Boschung, Firma: *See*—
Boschung, Marcel, 4,203,459, Cl. 137-119.000.
Marconi, Gary G.: *See*—
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,204,039, Cl. 435-118.000.
Margotte, Dieter; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Thermoplastic moulding composition. 4,204,047, Cl. 525-67.000.
Margraf, Adolf. Pocket or tube filters. 4,203,737, Cl. 55-287.000.
Margueratt, Oatway, to Seeburn Metal Products Limited. Double fingered bumper jack body. 4,203,578, Cl. 254-109.000.
Mariani, Angelo: *See*—
Isotton, Adriano, 4,204,083, Cl. 174-9.00F.
Marker, Hannes. Safety ski binding. 4,203,614, Cl. 280-637.000.
Marks, Kenneth A.: *See*—
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Marks, William S., to BEI Electronics, Inc. Fin and nozzle unit for a free-flight rocket. 4,203,569, Cl. 244-3.230.
Marschner, Friedemann: *See*—
Supp, Emil; Jockel, Heinz; Krumm, Hagen; and Marschner, Friedemann, 4,203,915, Cl. 260-449.500.
Martin, Charles W.; and Ward, Eldon L., to Dow Chemical Company, The. Bis(dithiocarbamate) salts. 4,203,999, Cl. 424-286.000.
Martin, David L., to Krebs Engineers. Hydrocyclone underflow density control. 4,203,834, Cl. 209-211.000.
Maruoka, Hiroyuki, to Nissan Motor Company, Limited. Electrostatic apparatus for controlling flow rate of liquid. 4,203,398, Cl. 123-119.0EC.
Maruyama, Hiromi: *See*—
Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, 4,204,044, Cl. 435-280.000.
Marzett, Rodrique L.: *See*—
Brewbaker, James L.; and Marzett, Rodrique L., 4,204,048, Cl. 525-343.000.
Maschinenfabrik Peter Zimmer Aktiengesellschaft: *See*—
Zimmer, Peter; Kudlich, Hans; Schweitzer, Karl; and Mayr, Walter, 4,203,554, Cl. 239-585.000.
Masciello, Doris E., heir: *See*—
Jamison, John W.; Welty, William R.; and Masciello, Vincent A., deceased, 4,203,257, Cl. 51-2.00R.
Masciello, Vincent A., deceased: *See*—
Jamison, John W.; Welty, William R.; and Masciello, Vincent A., deceased, 4,203,257, Cl. 51-2.00R.
Mascioli, Rocco L.: *See*—
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,204,062, Cl. 544-351.000.
Mase, Yoshio; Hayashi, Tadayoshi; Natsuume, Shinichi; Kobayashi, Yasuhisa; and Moriya, Yoshiyuki, to Honda Giken Kogyo Kabushiki Kaisha. Catalyst converter for cleaning exhausts of cars. 4,203,949, Cl. 422-179.000.
Mason, Arthur G.; and Hutt, Peter R., to Independent Broadcasting Authority. Digital testing apparatus. 4,204,228, Cl. 358-139.000.
Mason, Paul B.: *See*—
Stella, Joseph A.; and Mason, Paul B., 4,203,655, Cl. 352-78.00R.
Massachusetts Institute of Technology: *See*—
Meissner, Herman P., 4,204,033, Cl. 429-33.000.
Massey, Harold: *See*—
Rose, Robert N., 4,203,761, Cl. 75-40.000.
Massol, Jean-Jacques: *See*—
Battigelli, Jean A.; Bouquet, Francois; Fezenko, Igor; and Massol, Jean-Jacques, 4,203,746, Cl. 65-6.000.
Battigelli, Jean A.; Bouquet, Francois; and Massol, Jean-Jacques, 4,203,774, Cl. 106-50.000.
Mastroianni, Martin J.; and Orfeo, Sabatino R., to Allied Chemical Corporation. Apparatus with dielectric gas mixtures in substantially uniform field. 4,204,084, Cl. 174-25.00G.
Masukawa, Toyoaki: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kaneko, Yutaka; Masukawa, Toyoaki; and Kawasaki, Mikio, 4,203,767, Cl. 430-376.000.
Mathews, Arlene L. Trash bag protector. 4,203,479, Cl. 150-3.000.
Mathews, Marion J., III: *See*—
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., III, 4,203,808, Cl. 204-23.000.
Mathieu, Serge, to H.O.P. Consulab Inc. Apparatus and method for regulating the power factor in an electrical distributing-network line. 4,204,150, Cl. 323-102.000.
Matlock, Patricia: *See*—
Matlock, William C.; and Matlock, Patricia, 4,203,426, Cl. 126-425.000.
Matlock, William C.; and Matlock, Patricia. Solar energy converter carousel mounted rack. 4,203,426, Cl. 126-425.000.
Matson, Crawford: *See*—
Zemek, Albert W.; Tomko, Frederick; Matson, Crawford; and Darrow, Burr, 4,203,583, Cl. 269-234.000.
Matsui, Hirofumi. Green sand composition for casting. 4,203,771, Cl. 106-38.350.
Matsui, Hisashi: *See*—
Kataoka, Takeshi; Matsumoto, Hiroshi; and Matsui, Hisashi, 4,204,179, Cl. 334-7.000.
Matsumoto, Hiroshi: *See*—
Kataoka, Takeshi; Matsumoto, Hiroshi; and Matsui, Hisashi, 4,204,179, Cl. 334-7.000.

Matsumoto, Koichi: *See*—
Maeda, Yoshio; Matsumoto, Koichi; and Nishiwaki, Koji, 4,203,669, Cl. 356-332.000.
Matsumura, Hiromu: *See*—
Narisada, Masayuki; Matsumura, Hiromu; and Nagata, Wataru, 4,203,982, Cl. 424-246.000.
Matsumura, Jube: *See*—
Sakai, Akira; and Matsumura, Jube, 4,203,297, Cl. 60-660.000.
Matsumura, Michio: *See*—
Noda, Yoichiro; Matsumura, Michio; Chiba, Norio; and Hata, Masahito, 4,203,815, Cl. 204-159.200.
Matsuo, Syunji: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kaneko, Yutaka; Masukawa, Toyoaki; and Kawasaki, Mikio, 4,203,767, Cl. 430-376.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hirai, Akira; Nishimoto, Kazuyuki; and Kuroki, Hisataka, 4,203,886, Cl. 260-37.0SB.
Narikiyo, Kazuhiko; Itemadani, Eiji; and Maeda, Yoshinobu, 4,203,224, Cl. 33-149.00R.
Obata, Shuichi; and Sugihara, Takayuki, 4,203,606, Cl. 274-23.00R.
Yasuno, Yoshitake; Watari, Masafumi; Tsutsui, Hiroshi; Ikedo, Masaru; and Yamamoto, Osamu, 4,204,119, Cl. 250-337.000.
Matsushita Electric Works, Ltd.: *See*—
Abura, Yoshinori; Toyomi, Yuritugu; and Nishino, Motohisa, 4,203,431, Cl. 128-39.000.
Matsushita, Takeshi; Mamine, Takayoshi; Hayashi, Hisao; and Nishiyama, Kazuo, to Sony Corporation. Fe Ion implantation into semiconductor substrate for reduced lifetime sensitivity to temperature. 4,203,780, Cl. 148-1.500.
Matsushita, Yoshihiro: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,203,899, Cl. 548-194.000.
Matt, Richard J.: *See*—
Thompson, Richard T.; and Matt, Richard J., 4,203,509, Cl. 193-37.000.
Mattchen, Terry M., to American Safety Equipment Corporation. Automatic chuck for drill. 4,203,222, Cl. 433-129.000.
Mattel, Inc.: *See*—
Kral, Fred G., 4,203,602, Cl. 273-121.00A.
Matthies, Paul; Kunde, Joachim; and Hoerauf, Werner, to BASF Aktiengesellschaft. Hydrolytic polymerization of epsilon-caprolactam. 4,204,049, Cl. 526-65.000.
Mattis, Donald J.: *See*—
Horwitt, Laurence G.; and Mattis, Donald J., 4,204,108, Cl. 219-265.000.
Horwitt, Laurence G.; and Mattis, Donald J., 4,204,109, Cl. 219-265.000.
Maughan, William S.: *See*—
Fraenkel, Herbert; Gough, Patrick B.; and Maughan, William S., 4,203,522, Cl. 209-558.000.
Mauk, Gerhard: *See*—
Peter, Julius; Johannsen, Peter; and Mauk, Gerhard, 4,203,480, Cl. 152-209.0NT.
Mayer, Herbert: *See*—
Glock, Hans; and Mayer, Herbert, 4,204,276, Cl. 365-189.000.
Mayer, Robert W.; and Smorzaniuk, Adam, to Amerace Corporation. Fluid pressure indicator. 4,203,385, Cl. 116-270.000.
Mayes, Warden W., to Cosden Technology, Inc. Process for producing high purity aromatic compounds. 4,203,826, Cl. 208-64.000.
Mayr, Walter: *See*—
Zimmer, Peter; Kudlich, Hans; Schweitzer, Karl; and Mayr, Walter, 4,203,554, Cl. 239-585.000.
MCA Disco-Vision, Inc.: *See*—
Isailovic, Jordan, 4,204,199, Cl. 340-347.0DD.
McAlister, George, to Plastic-Craft, Inc. Paint can accessory. 4,203,537, Cl. 222-570.000.
McCallum, Robert: *See*—
Osmera, Miroslav; Enter, Rudolf; and McCallum, Robert, 4,203,675, Cl. 400-144.200.
McCarthy, Alfred F.: *See*—
Johnson, Philip A.; and McCarthy, Alfred F., 4,203,488, Cl. 165-80.00B.
McCarthy, Edward C., to Harris Corporation. Display of video images. 4,204,208, Cl. 340-745.000.
McCarthy, Edward C.: *See*—
Bakula, Richard E.; and McCarthy, Edward C., 4,204,206, Cl. 340-721.000.
Bakula, Richard E.; and McCarthy, Edward C., 4,204,207, Cl. 340-723.000.
McClain, Harold F. Stone cutting apparatus. 4,203,414, Cl. 125-23.00C.
McClellan, Malcolm B.: *See*—
Baker, Don R.; and McClellan, Malcolm B., 4,203,998, Cl. 424-283.000.
McCord, William F.: *See*—
Faunce, Frank R., 4,203,966, Cl. 424-52.000.
McCormick, Harold: *See*—
Wolpert, Richard W.; Wolpert, Alan T.; Bender, John F.; and McCormick, Harold, 4,203,644, Cl. 339-128.000.
McElwaine, David C., to Polaroid Corporation. Feed shuttle mechanism for motion picture film strips. 4,203,656, Cl. 352-194.000.
McGinnis, Edgar L.: *See*—
Carr, Norman L.; and McGinnis, Edgar L., 4,203,839, Cl. 210-71.000.
McGrath, N. Christian, to Sprague Electric Company. Batch method for making solid-electrolyte capacitors. 4,203,194, Cl. 29-570.000.
McHugh, Edward H.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., 4,203,444, Cl. 128-276.000.
McKean, Walter A. Copper foil hypochlorite treatment method and product produced. 4,203,809, Cl. 204-32.00R.
McKellen, Patrick E., to Unigate Limited Co. Electro-chemical cells or batteries. 4,204,032, Cl. 429-13.000.
McLane, Jack S. Heat exchanger. 4,203,392, Cl. 122-17.000.
McLaughlin, Albert T.: *See*—
Getson, Edward F., Jr.; Kelley, John H.; McLaughlin, Albert T.; and Rathbun, Donald J., 4,204,250, Cl. 364-200.000.
McLeod, James A. Static converter suitable for high input voltage applications. 4,204,265, Cl. 363-71.000.
McMullen, James; and Vokac, James, to General Signal Corporation. Cage for low pressure silicon dioxide deposition reactors. 4,203,387, Cl. 118-715.000.
McNeilab, Inc.: *See*—
Umen, Michael J., 4,203,991, Cl. 424-267.000.
McReynolds, Robert D.: *See*—
Wolter, Karl E.; Peters, William J.; Roberts, Donald R.; McReynolds, Robert D.; Broomfield, Junior; and Crews, Ernest R., 4,203,253, Cl. 47-10.000.
Mead Corporation, The: *See*—
Sanders, Frederick W., 4,203,619, Cl. 282-27.500.
Mead, Ralph T.; Greatbatch, Wilson; Rudolph, Frank W.; and Frenz, Norbert W., Jr., to Wilson Greatbatch Ltd. Methods for making lithium-iodine cell. 4,203,201, Cl. 29-623.100.
Meckel, Joachim F.; Rohde, Wolfgang; Siebert, Werner; Wagener, Dietrich; Flockenhaus, Claus; and Galow, Manfred, to Bergwerksverband GmbH; and Didier Engineering GmbH. Charging of coke ovens with preheated coal. 4,203,803, Cl. 201-40.000.
Medeci Developments Limited: *See*—
Dale, Gerald, 4,203,169, Cl. 4-144.100.
Medves, James S., to Erco Industries Limited. Modified phosphorus furnace operation. 4,203,957, Cl. 423-323.000.
Meissner, Herman P., to Massachusetts Institute of Technology. Electrical cell construction. 4,204,033, Cl. 429-33.000.
Melis, Janos: *See*—
Csizy, Tibor; Karpat, Arpad; Melis, Janos; and Szemerey, Zoltan, 4,204,184, Cl. 337-295.000.
Melton, Keith: *See*—
Kunzli, Roland; Melton, Keith; and Mercier, Olivier, 4,203,313, Cl. 72-364.000.
Menapace, Henry R., to Goodyear Tire & Rubber Company, The. Selective hydrogenation of cyclopentadiene to form cyclopentene. 4,204,081, Cl. 585-274.000.
Menke, Josef F., to Electro Optik GmbH & Co. KG. Method of and device for scanning pictures. 4,204,122, Cl. 250-347.000.
Mercier, Olivier: *See*—
Kunzli, Roland; Melton, Keith; and Mercier, Olivier, 4,203,313, Cl. 72-364.000.
Merck & Co., Inc.: *See*—
Arnett, Carroll D.; Wright, Jeremy; and Zenker, Nicolas, 4,204,069, Cl. 548-325.000.
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,203,988, Cl. 424-266.000.
Carlo, Dennis J.; Hagopian, Arpi; and Kniskern, Peter J., 4,203,970, Cl. 424-92.000.
Fisher, Michael H.; and Tolman, Richard L., 4,203,976, Cl. 424-180.000.
Shih, David H., 4,203,902, Cl. 260-326.310.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Kupers, Walter; and Della Mura, Pasquale, 4,203,997, Cl. 424-280.000.
Messer Griesheim GmbH: *See*—
Dinglinger, Gunter, 4,203,299, Cl. 62-49.000.
Messrs. J. Walter Co. Maschinen GmbH: *See*—
Liebal, Eberhard; and Eichenberg, Norbert, 4,203,753, Cl. 65-163.000.
Metabio-Joullie: *See*—
Joullie, Maurice; Maillard, Gabriel; Lakah, Lucien; Warolin, Christian J. M.; and Pascal, Yves R. A., 4,203,986, Cl. 424-250.000.
Metalimphy: *See*—
Guilgue, Jean L., 4,203,544, Cl. 235-449.000.
Metallgesellschaft: *See*—
Supp, Emil; Jockel, Heinz; Krumm, Hagen; and Marschner, Friedemann, 4,203,915, Cl. 260-449.500.
Metrailer, William J.; and Mueller, David E., to Exxon Research & Engineering Co. Process for the preparation of a vanadium-containing metallic ash concentrate. 4,203,759, Cl. 75-0.5BA.
Metzner, Gerd L., to Schleicher GmbH & Co. Relais-Werke KG. Time delay circuit for timing relays. 4,204,242, Cl. 361-198.000.
Meurer, Peter C.: *See*—
Fachbach, Heinz; Thien, Gerhard; and Meurer, Peter C., 4,203,409, Cl. 123-198.00E.
Meyer, Horst, to Bayer Aktiengesellschaft. Process for the preparation of 2-nitrobenzaldehyde. 4,203,928, Cl. 568-424.000.
Meyers, George L., to American Can Company. Packaging structure and apparatus useful in its assembly. 4,203,355, Cl. 93-58.00R.
Michaels, Alan S., to Alza Corporation. Device for delivering drug to a fluid environment. 4,203,442, Cl. 128-260.000.
Midgitronics Inc.: *See*—
Hill, Richard D., 4,204,144, Cl. 318-568.000.
Midland-Ross Corporation: *See*—
DePenti, Kenneth L., 4,203,523, Cl. 213-100.00W.

Mietens, Gerhard: *See*—
Ahlgrim, Michael; Mietens, Gerhard; Krieger, Wilfried; and Sorbe, Gunter, 4,203,637, Cl. 339-5.00R.
Mihalik, Nicholas. Scooter. 4,203,610, Cl. 280-87.04R.
Mikolajczak, Kenneth L.; and Smith, Cecil R., Jr., to United States of America, Agriculture. Synthetic cephalotaxine esters having antileukemic P388 activity. 4,203,996, Cl. 424-274.000.
Miller, C. W.: *See*—
Raley, Garland E.; Miller, C. W.; and Smith, D. L., 4,203,715, Cl. 425-131.100.
Miller, Donald M., to United States of America, Energy. Torque-balanced vibrationless rotary coupling. 4,203,303, Cl. 64-12.000.
Miller, Gabriel L., to Bell Telephone Laboratories, Incorporated. Laser deformation of semiconductor junctions. 4,203,781, Cl. 148-1.500.
Miller, Glen E., to Boeing Company, The. Method and apparatus for cutting optical fibers. 4,203,539, Cl. 225-2.000.
Miller, John R., to Southern Railway Company. Railway ballast cleaning apparatus. 4,203,493, Cl. 171-16.000.
Miller, Richard T. Smoking pipe. 4,203,456, Cl. 131-230.000.
Miller, Robert G., to Caterpillar Tractor Co. Electronic switching control for rear transmission. 4,203,375, Cl. 74-335.000.
Millet, Christian; and Gauthier, Francis, to Les Cables de Lyon. Connector for simultaneous end-to-end connection of groups of seven optical fibres. 4,203,650, Cl. 350-96.210.
Millipore Corporation: *See*—
Grandine, Joseph D., 2nd, 4,203,847, Cl. 210-490.000.
Grandine, Joseph D., II, 4,203,848, Cl. 210-490.000.
Mills, Earl G.: *See*—
Rose, Robert N., 4,203,761, Cl. 75-40.000.
Milly, George H., to Geomet, Incorporated. Cylindrical method of quantifying fugitive emission rates from pollution sources. 4,204,121, Cl. 250-343.000.
Mims, Matlock M., to Bergeron, Gregory Bernard; and Heiner, Robert James. Apparatus and method for alleviating physiological conditions by directed spray of liquid toward body tissue. 4,203,437, Cl. 128-229.000.
Minard, James V.; Goldman, Loeb J.; and Foss, Dale R., to United States of America, Air Force. Adjustable connector. 4,203,642, Cl. 339-75.0MP.
Minatono, Shobu; Takamatsu, Hideo; Yamauchi, Junnosuke; and Terao, Katsuyoshi, to Kuraray Company, Limited. Pressure sensitive adhesive composition. 4,204,046, Cl. 525-65.000.
Minery, Aime, to Casutt, Toni. Mechanism for closing egg containers. 4,203,272, Cl. 53-374.000.
Minks, Floyd M. Fluid flow measurement apparatus. 4,203,574, Cl. 251-139.000.
Minnesota Mining and Manufacturing Company: *See*—
Cowles, Arthur L.; and Ensign, Thomas C., 4,203,325, Cl. 73-304.00R.
Fatuzzo, Carol L.; and Foss, George D., 4,204,125, Cl. 250-486.000.
Mir, Ghulam N.: *See*—
Douglas, George H.; Mir, Ghulam N.; Won, Chong M.; and Studt, William L., 4,203,984, Cl. 424-249.000.
Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; and Won, Chong M., 4,203,983, Cl. 424-249.000.
Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; Patel, Dahyabhai M.; Won, Chong M.; and Alioto, Ronald L., 4,203,985, Cl. 424-249.000.
Missioux, Jean L. Installation for tempering long cylindrical pieces in form and in thin layer. 4,203,579, Cl. 266-117.000.
Missmahl, Bodo: *See*—
Boettger, Friedrich; Eugster, Walter; Lenssen, Walter; and Missmahl, Bodo, 4,203,336, Cl. 83-550.000.
Mistretta, Charles A., to Wisconsin Alumni Research Foundation. Real-time digital X-ray subtraction imaging. 4,204,225, Cl. 358-111.000.
Mistretta, Charles A.; Kruger, Robert A.; and Houk, Theodore L., to Wisconsin Alumni Research Foundation. Real-time digital X-ray time interval difference imaging. 4,204,226, Cl. 358-111.000.
Mitchell, Richard F., to U.S. Philips Corporation. Acoustic wave devices. 4,204,178, Cl. 333-194.000.
Mitchell, Terry L.; and Immink, David A., to Herman Miller, Inc. Transport vehicle. 4,203,609, Cl. 280-47.110.
Mitchell, Willard N.: *See*—
Sims, J. Robert, Jr.; Mitchell, Willard N.; and Williamson, Charles W., 4,203,942, Cl. 264-559.000.
Mitel Corporation: *See*—
Cepelinski, Jacob, 4,204,094, Cl. 179-18.0FA.
Mitrovich, Svetislav, to Xerox Corporation. High-speed printer with self-adjusting cable preload mechanism. 4,203,680, Cl. 400-335.000.
Mitsubishi Chemical Industries Limited: *See*—
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, 4,203,724, Cl. 23-230.00B.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Imataki, Mitsumasa; Mochizuki, Mikio; and Shibuya, Yoshikazu, 4,204,239, Cl. 361-127.000.
Miyake, Yasufumi: *See*—
Kakuhashi, Takeshi; and Miyake, Yasufumi, 4,204,187, Cl. 338-307.000.
Miyata, Koji, to Toyota Shatai Kabushiki Kaisha. Apparatus for preventing or damping vibrations and noise in a vehicle. 4,203,499, Cl. 180-89.120.
Mizuno, Shoji, to Nippon Electric Co., Ltd. Pattern transmission system comprising an encoder for encoding partial thinned patterns in two scanning lines along only one boundary line. 4,204,232, Cl. 358-260.000.
Mizuno, Tamotsu: *See*—
Enomoto, Takamitsu; Tanaka, Kyoji; Kawamoto, Hiromi; Mizuno, Tamotsu; and Fujinaga, Masao, 4,203,955, Cl. 423-308.000.
Mjulendorf, Oleg S.: *See*—
Goriletsky, Valentin I.; Mjulendorf, Oleg S.; Radkevich, Alexei V.; and Eidelman, Lev G., 4,203,951, Cl. 422-249.000.
Mobil Oil Corporation: *See*—
Rollmann, Louis D.; and Walsh, Dennis E., 4,203,830, Cl. 208-236.000.
Rollmann, Louis D., 4,203,869, Cl. 252-455.00Z.
Mochizuki, Mikio: *See*—
Imataki, Mitsumasa; Mochizuki, Mikio; and Shibuya, Yoshikazu, 4,204,239, Cl. 361-127.000.
Moe, Walter; Bernstein, Lawrence A.; and Heller, David, to Diker-Moe Associates. Toy vehicle launcher and toy vehicle for use therewith. 4,203,247, Cl. 46-1.00K.
Mohr, Robert G.: *See*—
VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,203,639, Cl. 339-22.00R.
Molisani, Justin J.: *See*—
Cook, Sanford L.; Molisani, Justin J.; and Dennison, Kenneth I., Jr., 4,203,622, Cl. 292-221.000.
Mollica, Francesco, to Mollica S.r.l. Knife for tableware and kitchen use. 4,203,213, Cl. 30-343.000.
Mollica S.r.l.: *See*—
Mollica, Francesco, 4,203,213, Cl. 30-343.000.
Mollier, Jean H.: *See*—
Giraud, Georges; and Mollier, Jean H., 4,204,113, Cl. 235-375.000.
Monadnock Lifetime Products, Inc.: *See*—
Starrett, Paul D., 4,203,599, Cl. 273-84.00R.
Monostori, Endre: *See*—
Aradi, Emil; Blickle, Tibor; Monostori, Endre; Nemeth, Jeno; Pallai, Ivanne; and Varga, Janos, 4,203,228, Cl. 34-10.000.
Monsanto Company: *See*—
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., III, 4,203,808, Cl. 204-23.000.
Coran, Aubert Y.; and Patel, Raman, 4,203,884, Cl. 260-33.6AQ.
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,204,052, Cl. 525-398.000.
Gaertner, Van R., 4,203,756, Cl. 71-86.000.
Yonko, Jon D., 4,204,111, Cl. 219-411.000.
Montedison S.p.A.: *See*—
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, 4,203,882, Cl. 260-28.50A.
Montgomery, John R.; and Richards, James S. Device for affecting deflection control of an elongated musical instrument shaft. 4,203,342, Cl. 84-293.000.
Monzo, Charles: *See*—
Kmak, Walter S.; and Monzo, Charles, 4,203,825, Cl. 208-48.00R.
Moody, Joe W. Football game. 4,203,605, Cl. 273-247.000.
Moore, Charles E.: *See*—
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Moretto, Hans-Heinrich: *See*—
Finke, Ulrich; Moretto, Hans-Heinrich; Niederprum, Hans; and Vorbruggen, Helmut, 4,203,914, Cl. 556-428.000.
Morgan, Dennis R.: *See*—
Fitelson, Michael M.; and Morgan, Dennis R., 4,204,262, Cl. 364-822.000.
Morgan, Michael J., to Inficon Leybold-Heraeus, Inc. Solid state sensor. 4,203,199, Cl. 29-612.000.
Mori, Ikuo, to Nippon Kogaku K.K. Inverted telephoto type wide angle lens system. 4,203,653, Cl. 350-216.000.
Morimoto, Akira: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,203,899, Cl. 548-194.000.
Moriya, Yoshiyuki: *See*—
Mase, Yoshio; Hayashi, Tadayoshi; Natsuume, Shinichi; Kobayashi, Yasuhisa; and Moriya, Yoshiyuki, 4,203,949, Cl. 422-179.000.
Morris, Earl L.; Hafner, Walter V.; and Sally, Theodore J., to Acorn Engineering Co. Overflow inhibitor for plumbing fixtures. 4,203,173, Cl. 4-427.000.
Morris, Jesse L.; and Sugalski, Raymond K., to General Electric Company. Assembly machine. 4,203,206, Cl. 29-731.000.
Moss, Ernest K.: *See*—
Beale, John H.; and Moss, Ernest K., 4,204,020, Cl. 428-310.000.
Mostek Corporation: *See*—
Dozier, Harold W., 4,204,131, Cl. 307-251.000.
Motoren- und Turbinen-Union Munchen GmbH: *See*—
Weiler, Wolfgang, 4,203,283, Cl. 60-39.360.
Motorola, Inc.: *See*—
Ho, Roland K., 4,204,244, Cl. 361-283.000.
Javeri, Rupin J., 4,204,157, Cl. 324-166.000.
Mowry, Dale A. Storm window assembly. 4,203,256, Cl. 49-465.000.
Moyer, Richard L.: *See*—
Krysiak, William J.; and Moyer, Richard L., 4,203,556, Cl. 241-86.100.
MTA Muszaki Kemiai Kutato Intezet: *See*—
Aradi, Emil; Blickle, Tibor; Monostori, Endre; Nemeth, Jeno; Pallai, Ivanne; and Varga, Janos, 4,203,228, Cl. 34-10.000.
MTD Products Inc.: *See*—
Plamper, Gerhard R., 4,203,276, Cl. 56-202.000.
Mudge, Craig: *See*—
Hitz, George E.; Kaman, Charles H.; Mudge, Craig; O'Loughlin, James F.; and Sullivan, Daniel T., 4,204,252, Cl. 364-200.000.

Mueller, David E.: *See*—
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Mueller, Herbert; and Huchler, Otto H., to BASF Aktiengesellschaft. Manufacture of cyclic ethers. 4,203,908, Cl. 260-346.110.

Mukai, Sadayoshi; Otani, Yoshiaki; and Yamaguchi, Osamu. Method of purifying triaryl phosphate. 4,203,933, Cl. 260-990.000.

Mullen, James P. Tire removal indicator device. 4,203,382, Cl. 116-28.00R.

Muller, Rolf; and Ribka, Joachim, to Cassella Aktiengesellschaft. Process and intermediates for preparing fiber-reactive phthalocyanine dyes. 4,204,056, Cl. 542-416.000.

Munster, Gerhard, to Hoechst Aktiengesellschaft. Process for the preparation of nitrous oxide. 4,203,959, Cl. 423-400.000.

Murai, Keiichi: *See*—
Tosaka, Umi; Kondo, Hideyo; Murai, Keiichi; and Toma, Hitoshi, 4,203,764, Cl. 430-67.000.

Muraoka, Teruo: *See*—
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Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Piezoelectric elements of organic high molecular weight materials. 4,204,135, Cl. 310-357.000.

Murphy, Richard J., to Boeing Company, The. Apparatus for the automated assembly of major subassemblies. 4,203,204, Cl. 29-703.000.

Muschelknautz, Horst, to Voith Turbo GmbH & Co., KG. Hydrodynamic control coupling. 4,203,289, Cl. 60-358.000.

Muzzani, Aldo; and Paccapelo, Ilio, to Ing. C. Olivetti & C., S.p.A. Electronic computer including an information refreshing arrangement. 4,204,254, Cl. 364-200.000.

MX-Processer Reinhardt & Co. AB: *See*—
Reinhardt, Hans; and Kuylenstierna, Ulf V., 4,203,964, Cl. 423-658.500.

Myers, Harry K., Jr., to Sun Oil Company of Pennsylvania. Codimer of norbornadiene and cyclohexadiene. 4,203,930, Cl. 585-22.000.

Nagamoto, Itsushi, to Nippon Gakki Seizo Kabushiki Kaisha. Racket and a method for manufacturing same. 4,203,596, Cl. 273-73.00J.

Naganawa, Hiroshi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,204,038, Cl. 435-78.000.

Nagashima, Kazuo: *See*—
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Nagata, Wataru: *See*—
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Nagel, Hartmut: *See*—
Walter, Siegfried; Schneider, Michael; and Nagel, Hartmut, 4,203,363, Cl. 101-409.000.

Naito, Hideki: *See*—
Inouye, Kozo; and Naito, Hideki, 4,203,768, Cl. 430-388.000.

Nakae, Hideo; Ozaki, Toshinori; Nakane, Kazunori; and Shimaguchi, Takashi, to Hitachi, Ltd. Method of production of vibration absorbing metallic material. 4,203,195, Cl. 29-505.000.

Nakagawa, Junichi: *See*—
Takasaki, Yoshitaka; Kita, Yasuhiro; Nakagawa, Junichi; and Ishizuka, Kohei, 4,204,176, Cl. 333-28.00R.

Nakaguti, Osamu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,203,897, Cl. 260-239.100.

Nakamoto, Masao: *See*—
Ochiai, Hiroyoshi; and Nakamoto, Masao, 4,203,215, Cl. 30-383.000.

Nakamura, Katuyoshi: *See*—
Shimizu, Koh; Uchimura, Terumi; Uede, Ken-Ichi; and Nakamura, Katuyoshi, 4,203,838, Cl. 210-63.00R.

Nakamura, Shigefumi; Tokuda, Hiromi; and Nohira, Hidetaka, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system. 4,203,399, Cl. 123-119.00A.

Nakane, Kazunori: *See*—
Nakae, Hideo; Ozaki, Toshinori; Nakane, Kazunori; and Shimaguchi, Takashi, 4,203,195, Cl. 29-505.000.

Nakaoka, Azuma: *See*—
Shimizu, Norio; Odawara, Youji; Yamaguchi, Tetsuo; Saitou, Setsuo; Nakaoka, Azuma; and Ichihashi, Kazuaki, 4,203,841, Cl. 210-205.000.

Nakarai, Masazumi, to Sharp Kabushiki Kaisha. Ink jet system for issuing ink under a predetermined uniform pressure in an ink jet system printer. 4,204,215, Cl. 346-140.00R.

Nakasho, Kazuo, to Olympus Optical Company Limited. Speaker device having a holding means for a superminiature tape recorder. 4,204,236, Cl. 360-137.000.

Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., to Eli Lilly and Company. Process for producing deoxynarasin antibiotics. 4,204,039, Cl. 435-118.000.

Nakazawa, Yukiyoshi: *See*—
Sugawara, Katsuro; Nakazawa, Yukiyoshi; and Itoh, Katsuhiko, 4,203,799, Cl. 156-601.000.

Napolitano, Vincenzo. Tire retreading automatic press. 4,203,713, Cl. 425-23.000.

Narikiyo, Kazuhiko; Itemadani, Eiji; and Maeda, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Insertion space checking jig for electronic components. 4,203,224, Cl. 33-149.00R.

Narisada, Masayuki; Matsumura, Hiromu; and Nagata, Wataru, to Shionogi & Co., Ltd. Arylmalonamidomethoxycephalosporins. 4,203,982, Cl. 424-246.000.

Nartron Corporation: *See*—
Bull, David W., 4,204,102, Cl. 200-153.00J.

Nash, John E.: *See*—
Knopp, Arthur A.; Nash, John E.; and Lewis, Richard P., 4,203,221, Cl. 433-117.000.

Naslund, Edwin N.; and MacDonald, Ian, to Cal-Wood Door. Fire-resistant composite wood structure particularly adapted for use in fire doors. 4,203,255, Cl. 49-399.000.

National Research Development Corporation: *See*—
Cranfield, Peter J., 4,203,220, Cl. 433-228.000.

Natsuume, Shinichi: *See*—
Mase, Yoshio; Hayashi, Tadayoshi; Natsuume, Shinichi; Kobayashi, Yasuhisa; and Moriya, Yoshiyuki, 4,203,949, Cl. 422-179.000.

Naumenko, Viktor A.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

NCR Canada Ltd. - NCR Canada Ltee: *See*—
Osmera, Miroslav; Enter, Rudolf; and McCallum, Robert, 4,203,675, Cl. 400-144.200.

Nelson, David E., to Hydroacoustics Inc. Methods and apparatus for the generation and transmission of signals for echo location and other signalling purposes, as in geophysical exploration. 4,204,278, Cl. 367-39.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-deoxy-9,10-didehydro-PGD$_2$ analogs. 4,203,924, Cl. 568-379.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-cis-4,5-didehydro PGF$_1$ compounds. 4,204,079, Cl. 568-838.000.

Nemeth, Jeno: *See*—
Aradi, Emil; Blickle, Tibor; Monostori, Endre; Nemeth, Jeno; Pallai, Ivanne; and Varga, Janos, 4,203,228, Cl. 34-10.000.

Nemoto, Tsuneo, to Sony Corporation. Tape reel. 4,203,564, Cl. 242-71.800.

Neuss, Norbert: *See*—
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,204,039, Cl. 435-118.000.

New Archery Products Corp.: *See*—
Simo, Miroslav A., 4,203,601, Cl. 273-421.000.

New York Institute of Technology: *See*—
Glenn, William E., Jr.; and Ludeke, Carl A., 4,203,298, Cl. 62-2.000.

NGK Spark Plug Co., Ltd.: *See*—
Tanaka, Hiroshi; and Sakurai, Kenji, 4,203,690, Cl. 407-119.000.
Tanaka, Hiroshi; and Yamamoto, Yoshihiro, 4,203,733, Cl. 51-295.000.

Nichols, Charles F.: *See*—
Burnham, Bradshaw; and Nichols, Charles F., 4,203,365, Cl. 102-214.000.

Nichols, Robert W., to Ford Motor Company. Hydrokinetic torque converter mechanism with compound impeller. 4,203,288, Cl. 60-345.000.

Nicholson, Terence P. Corrugated gaskets. 4,203,608, Cl. 277-235.00B.

Niederprum, Hans: *See*—
Finke, Ulrich; Moretto, Hans-Heinrich; Niederprum, Hans; and Vorbruggen, Helmut, 4,203,914, Cl. 556-428.000.

Nielsen, Donald R., to PPG Industries, Inc. Catalyst for hydrogenation of glycolic acid. 4,203,870, Cl. 252-459.000.

Nihei, Hideharu: *See*—
Ichise, Wataru; Kinjo, Yasuo; Enokida, Kenji; and Nihei, Hideharu, 4,203,860, Cl. 252-181.200.

Nikiforov, Alexandr M.: *See*—
Ermakov, Vladimir E.; Makarov, Viktor B.; Seidaliev, Fikrat S. O.; Nikiforov, Alexandr M.; Bushev, Alexandr V.; and Dozortsev, July K., 4,203,309, Cl. 72-96.000.

Nikkiso Co., Ltd.: *See*—
Yabe, Ikuo, 4,204,259, Cl. 438-497.000.

Nilsson, Gunnar, to AB CE Johansson. Position indicator for control measurements of surfaces. 4,203,225, Cl. 33-174.00L.

Nippon Electric Co., Ltd.: *See*—
Kage, Kouzou, 4,204,164, Cl. 455-135.000.
Kage, Kouzou, 4,204,170, Cl. 328-165.000.
Mizuno, Shoji, 4,204,232, Cl. 358-260.000.
Ohkubo, Toshio; Kajiwara, Yuji; and Itano, Tsutomu, 4,204,107, Cl. 219-216.000.

Nippon Electric Kagoshima, Ltd.: *See*—
Suehiro, Jun-ichi, 4,204,209, Cl. 340-758.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nagamoto, Itsushi, 4,203,596, Cl. 273-73.00J.
Takahashi, Hiroyoshi, 4,203,341, Cl. 84-255.000.

Nippon Kogaku K.K.: *See*—
Mori, Ikuo, 4,203,653, Cl. 350-216.000.

Nippon Oil & Fats Co. Ltd.: *See*—
Ishizaki, Takaharu; Igarashi, Taizo; and Shimizu, Hirozumi, 4,203,729, Cl. 44-51.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, 4,203,906, Cl. 260-346.400.

Nippon Soken, Inc.: *See—*
Tanaka, Eizi; Nishimatsu, Akira; and Ohashi, Michiniro, 4,203,296, Cl. 60-602.000.

Nippon Steel Corporation: *See—*
Kuroki, Katsuro; and Tanaka, Osamu, 4,203,784, Cl. 148-111.000.

Nippondenso Co., Ltd.: *See—*
Fujii, Hideo; and Kato, Minoru, 4,203,403, Cl. 123-148.0AC.
Nakamura, Shigefumi; Tokuda, Hiromi; and Nohira, Hidetaka, 4,203,399, Cl. 123-119.00A.
Terai, Shiro; Tanabe, Zenichi; and Fukui, Toshiyasu, 4,203,490, Cl. 165-134.00R.

Nishimatsu, Akira: *See—*
Tanaka, Eizi; Nishimatsu, Akira; and Ohashi, Michiniro, 4,203,296, Cl. 60-602.000.

Nishimoto, Kazuyuki: *See—*
Hirai, Akira; Nishimoto, Kazuyuki; and Kuroki, Hisataka, 4,203,886, Cl. 260-37.0SB.

Nishimura, Hideo; Noda, Shigeo; and Eto, Kunihiko, to Toyoda Koki Kabushiki Kaisha. Contact detecting apparatus. 4,203,691, Cl. 408-8.000.

Nishino, Motohisa: *See—*
Abura, Yoshinori; Toyomi, Yuritugu; and Nishino, Motohisa, 4,203,431, Cl. 128-39.000.

Nishiwaki, Koji: *See—*
Maeda, Yoshio; Matsumoto, Koichi; and Nishiwaki, Koji, 4,203,669, Cl. 356-332.000.

Nishiyama, Kazuo: *See—*
Matsushita, Takeshi; Mamine, Takayoshi; Hayashi, Hisao; and Nishiyama, Kazuo, 4,203,780, Cl. 148-1.500.

Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Shigehara, Itaru; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha Limited. Herbicidal phenoxy-phenoxyalkane thio esters. 4,203,758, Cl. 71-100.000.

Nissan Motor Company, Limited: *See—*
Aono, Shigeo; and Hosaka, Akio, 4,203,394, Cl. 123-32.0EE.
Maruoka, Hiroyuki, 4,203,398, Cl. 123-119.0EC.

Nitsche, Rainer: *See—*
Aberle, Lothar; Bank, Walter; Hillenkamp, Franz; Kaufmann, Raimund; Nitsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,204,117, Cl. 250-287.000.

Nitto Boseki Co., Ltd.: *See—*
Coggin, Charles H., Jr.; and Sakakura, Tatsuo R., 4,203,559, Cl. 242-18.00G.

Nitto Electric Industrial Co., Ltd.: *See—*
Kakuhashi, Takeshi; and Miyake, Yasufumi, 4,204,187, Cl. 338-307.000.

Noble, David L., to International Business Machines Corporation. System for positioning single gap magnetic head to follow moving recorded data track. 4,204,234, Cl. 360-77.000.

Noda, Shigeo: *See—*
Nishimura, Hideo; Noda, Shigeo; and Eto, Kunihiko, 4,203,691, Cl. 408-8.000.

Noda, Yoichiro; Matsumura, Michio; Chiba, Norio; and Hata, Masahito, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for producing crosslinked and foamed resin sheet. 4,203,815, Cl. 204-159.200.

Noel, Jean P.; and Party, Marcel, to Compagnie Industrielle de Mecanismes. Lock in particular for an automobile vehicle. 4,203,621, Cl. 292-216.000.

Nohira, Hidetaka: *See—*
Nakamura, Shigefumi; Tokuda, Hiromi; and Nohira, Hidetaka, 4,203,399, Cl. 123-119.00A.

Nonaka, Chiaki: *See—*
Arii, Hiroshi; Kawada, Hirohito; Yoshida, Takashi; and Nonaka, Chiaki, 4,204,246, Cl. 361-385.000.

Nordin, Ivan C.: *See—*
Parcell, Robert F.; and Nordin, Ivan C., 4,203,895, Cl. 260-239.00E.

Nordischer Maschinenbau Rud. Baader GmbH & Co KG: *See—*
Braeger, Horst K. H., 4,203,179, Cl. 17-62.000.

Nordstrom, Larry A.; and Szechy, Daniel J., to Scope Data Incorporated. Electronic control circuit for a high speed bidirectional printer. 4,203,678, Cl. 400-320.000.

Norsk Hydro a.s.: *See—*
Elstrom, Tore, deceased; Gustavsen, Per F.; and Kjohl, Olav, 4,204,053, Cl. 528-259.000.

North American Specialties Corp.: *See—*
Seidler, Jack, 4,203,648, Cl. 339-275.00T.

Northern Engraving Company: *See—*
Peters, Arnis E., 4,203,657, Cl. 353-26.00R.
Peters, Arnis E., 4,203,658, Cl. 353-26.00R.

Northern Telecom Limited: *See—*
Dupuis, Jean M., 4,203,698, Cl. 414-404.000.

Northwestern University: *See—*
Lautenschlager, Eugene P.; Robinson, Peter J.; and Vitek, Randall M., 4,203,223, Cl. 433-75.000.

Norton, Richard V., to Suntech, Inc. Fuel composition comprising a coal-oil slurry. 4,203,728, Cl. 44-51.000.

Nouvertne, Werner: *See—*
Margotte, Dieter; and Nouvertne, Werner, 4,204,047, Cl. 525-67.000.

Novotny, Michael A.: *See—*
Fox, William M.; and Novotny, Michael A., 4,204,218, Cl. 357-55.000.

Nukem GmbH: *See—*
Knotik, Karl; Leichter, Peter; Proksch, Emil; and Huschka, Hans, 4,203,863, Cl. 252-301.10W.

Nunciato, David J.; White, Norman H.; and Woodburn, William A., to Union Carbide Corporation. Method for decoking fired heater tubes. 4,203,778, Cl. 134-7.000.

Nuver, Eric L. H., to Esquire, Inc. Adjustable DC pulse circuit for variation over a predetermined range using two timer networks. 4,204,141, Cl. 315-311.000.

Nysen, Paul A., to Unisearch Limited. Recursive percentile estimator. 4,204,260, Cl. 364-554.000.

O & K Orenstein & Koppel Aktiengesellschaft: *See—*
Bangert, Hans; and Fengler, Georg, 4,203,238, Cl. 37-118.00R.

O/R Inc.: *See—*
Ostrom, David E., 4,203,340, Cl. 84-1.260.

Obata, Shuichi; and Sugihara, Takayuki, to Matsushita Electric Industrial Co., Ltd. Pickup arm device. 4,203,606, Cl. 274-23.00R.

Obata, Yukio; and Fujisaki, Masayuki, to Hitachi, Ltd. Detergent supplying device of a washing machine. 4,203,307, Cl. 68-17.00R.

Oberg, Karl-Erik: *See—*
Johnsson, M. K. Olof; Oberg, Karl-Erik; and Bertheussen, Harry, 4,203,763, Cl. 75-129.000.

Oce-van der Grinten N.V.: *See—*
Joosten, Joannes J. W. M., 4,203,588, Cl. 271-246.000.

Ochiai, Hiroyoshi; and Nakamoto, Masao, to Taniguchi, Hideaki. Endless chain for a chain saw. 4,203,215, Cl. 30-383.000.

Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. Thiazolylacetamido compounds. 4,203,899, Cl. 548-194.000.

O'Connor, Joseph M.; and Pasternak, Stephen F., to Peerless of America, Inc. Tubular articles of manufacture and method of making same. 4,203,311, Cl. 72-254.000.

Oda, Takashi: *See—*
Takemura, Kazutoshi; Oda, Takashi; and Kiyota, Fumio, 4,204,031, Cl. 428-539.500.

Odawara, Youji: *See—*
Shimizu, Norio; Odawara, Youji; Yamaguchi, Tetsuo; Saitou, Setsuo; Nakaoka, Azuma; and Ichihashi, Kazuaki, 4,203,841, Cl. 210-205.000.

Ogawa, Mayumi: *See—*
Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, 4,204,044, Cl. 435-280.000.

Ogura, Masaaki; Seko, Nachio; and Yano, Takato, to Ricoh Company, Ltd. Computer controlled electrostatic copying machine. 4,203,663, Cl. 355-14.00C.

Ohashi, Michiniro: *See—*
Tanaka, Eizi; Nishimatsu, Akira; and Ohashi, Michiniro, 4,203,296, Cl. 60-602.000.

Ohe, Keitaro: *See—*
Suzuki, Fumiyuki; Okutu, Toshimitu; and Ohe, Keitaro, 4,204,070, Cl. 560-94.000.

Ohkubo, Toshio; Kajiwara, Yuji; and Itano, Tsutomu, to Nippon Electric Co., Ltd. Thick-film thermal printing head and method of manufacturing the same. 4,204,107, Cl. 219-216.000.

Ohta, Takaaki; and Ito, Sadayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-brake-vibration type proportioning valve. 4,203,628, Cl. 303-6.00C.

Okada, Kenzoh: *See—*
Tanabe, Naoto; Okada, Kenzoh; and Maeda, Norio, 4,204,011, Cl. 427-57.000.

Okada, Motohiro, to Honda Giken Kogyo Kabushiki Kaisha. Air bag device for cars. 4,203,616, Cl. 280-737.000.

Okada, Taiiti: *See—*
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,203,899, Cl. 548-194.000.

Oki, Toshikazu: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,204,038, Cl. 435-78.000.

Oku, Teruo: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,203,897, Cl. 260-239.100.

Okubo, Yoshikazu. Vaulting box. 4,203,525, Cl. 220-4.00C.

Okutu, Toshimitu: *See—*
Suzuki, Fumiyuki; Okutu, Toshimitu; and Ohe, Keitaro, 4,204,070, Cl. 560-94.000.

O'Leary, Kevin J.: *See—*
Schenker, Barry A.; Sugano, Thomas T.; Stillman, Neil W.; and O'Leary, Kevin J., 4,203,822, Cl. 204-301.000.

Ollivier, Christian: *See—*
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,203,844, Cl. 210-321.00B.

O'Loughlin, James F.: *See—*
Hitz, George E.; Kaman, Charles H.; Mudge, Craig; O'Loughlin, James F.; and Sullivan, Daniel T., 4,204,252, Cl. 364-200.000.

Olympus Optical Company Limited: *See—*
Nakasho, Kazuo, 4,204,236, Cl. 360-137.000.

OMV Aktiengesellschaft: *See—*
Klezl, Peter, 4,203,881, Cl. 260-28.50A.

On, Lo Hou, to Hexagear Industries Limited. Shower heads. 4,203,550, Cl. 239-102.000.

Ono Seiko Co., Ltd.: *See—*
Kataoka, Takeshi; Matsumoto, Hiroshi; and Matsui, Hisashi, 4,204,179, Cl. 334-7.000.

Ono, Yoshiaki: *See—*
Takamizawa, Minoru; Abe, Akira; Ono, Yoshiaki; Sugimori, Yutaka; Kishibayashi, Tetsuo; and Ino, Makoto, 4,204,030, Cl. 428-447.000.

Onoue, Shoji, to Denki Onkyo Co., Ltd. Flyback transformer. 4,204,263, Cl. 363-68.000.

Opelika Manufacturing Corp.: *See—*
Brocklehurst, Charles E.; and Burton, Perry E., 4,204,012, Cl. 427-288.000.

Ore-Lube Corporation, The: *See—*
Silverstein, Joseph J., 4,203,854, Cl. 252-25.000.

O'Rell, Michael K.: *See—*
Jones, Robert J.; O'Rell, Michael K.; and Hom, Jim M., 4,203,922, Cl. 260-570.00R.

Orfeo, Sabatino R.: *See—*
Mastroianni, Martin J.; and Orfeo, Sabatino R., 4,204,084, Cl. 174-25.00G.

Orion-Yhtyma Oy: *See—*
Kjellander, Jan O.; and Danielsson, Dan G., 4,204,045, Cl. 435-301.000.

Osellame, Mirko: *See—*
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,203,866, Cl. 252-429.00C.

Oshita, Hirofumi: *See—*
Funaki, Yuji; Oshita, Hirofumi; Tanaka, Shizuya; Yamamoto, Shigeo; and Kato, Toshiro, 4,203,995, Cl. 424-273.00R.

Osmera, Miroslav; Enter, Rudolf; and McCallum, Robert, to NCR Canada Ltd. - NCR Canada Ltee. Pressure printer. 4,203,675, Cl. 400-144.200.

Ostrom, David E., to O/R Inc. Electronic musical instrument. 4,203,340, Cl. 84-1.260.

Otani, Yoshiaki: *See—*
Mukai, Sadayoshi; Otani, Yoshiaki; and Yamaguchi, Osamu, 4,203,933, Cl. 260-990.000.

Otsuki, Chihiro: *See—*
Usui, Kiyofumi; Otsuki, Chihiro; and Inukai, Sadaharu, 4,204,180, Cl. 335-205.000.

Otto Bihler Maschinenfabrik GmbH & Co. KG: *See—*
Bruller, Eduard; Augenstein, Reiner; and Bihler, Otto, 4,203,477, Cl. 140-105.000.

Owens-Illinois, Inc.: *See—*
Stoll, Andrew J., III, 4,203,526, Cl. 220-71.000.

Oxy Metal Industries Corporation: *See—*
Arcilesi, Donald A.; and Doty, Warren R., 4,204,013, Cl. 427-304.000.

Oyama, Yoshio, to Yoshida Kogyo K.K. Apparatus for automatically applying top end stops to a slide fastener chain. 4,203,207, Cl. 29-767.000.

Ozaki, Toshinori: *See—*
Nakae, Hideo; Ozaki, Toshinori; Nakane, Kazunori; and Shimaguchi, Takashi, 4,203,195, Cl. 29-505.000.

Ozimek, Chester E.: *See—*
Gall, John C.; Ozimek, Chester E.; and Chamberlain, Albert E., 4,203,681, Cl. 400-697.000.

Ozols, Gunars M.: *See—*
Kitcher, James R.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,203,800, Cl. 156-643.000.

Paccapelo, Ilio: *See—*
Muzzani, Aldo; and Paccapelo, Ilio, 4,204,254, Cl. 364-200.000.

Page-Gibson, Joseph E.: *See—*
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,203,861, Cl. 252-182.100.

Pai, George C. Security attache case with automatic alarm system. 4,204,202, Cl. 340-571.000.

Pall Corporation: *See—*
Silverwater, Bernard F., 4,203,384, Cl. 116-267.000.

Pallai, Ivanne: *See—*
Aradi, Emil; Blickle, Tibor; Monostori, Endre; Nemeth, Jeno; Pallai, Ivanne; and Varga, Janos, 4,203,228, Cl. 34-10.000.

Panico, Joseph J. Cardiovascular analysis, method and apparatus. 4,203,451, Cl. 128-672.000.

Papanu, Victor D.: *See—*
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,204,052, Cl. 525-398.000.

Papuchon, Michel: *See—*
Velasco, Gonzalo; and Papuchon, Michel, 4,203,649, Cl. 350-96.140.

Paradissis, Pantelis P.: *See—*
Kammiller, Neil; and Paradissis, Pantelis P., 4,204,266, Cl. 363-98.000.

Parcell, Robert F.; and Nordin, Ivan C., to Warner-Lambert Company. Process for the preparation of cis-(±)-3,4-dihydro-N,N,2-trimethyl-2H-1-benzopyran-3-amine and intermediates produced thereby. 4,203,895, Cl. 260-239.00E.

Pardee, Robert P., to Ball Corporation. Lubricants comprising fluoroalkyl esters. 4,203,856, Cl. 252-54.600.

Parfinenko, Ivan V.: *See—*
Vasilevsky, Petr N.; Ediny, Jury G.; and Parfinenko, Ivan V., 4,203,429, Cl. 128-1.00R.

Parisi, Michael S.; and Pauly, John A., to Walter Kidde & Company, Inc. Temperature probe. 4,204,186, Cl. 338-30.000.

Parker, Lawrence J., to Shelter Insulation, Inc. Polyisocyanurate foam laminate and process. 4,204,019, Cl. 428-310.000.

Parnaby, Derek. 6/30 Coal washing plant. 4,203,831, Cl. 209-13.000.

Parrack, Alvin L.; and Lunsford, Delbert R., to Texaco Inc. Method for enhancing seismic data. 4,204,279, Cl. 367-40.000.

Party, Marcel: *See—*
Noel, Jean P.; and Party, Marcel, 4,203,621, Cl. 292-216.000.

Pascal, Yves R. A.: *See—*
Joullie, Maurice; Maillard, Gabriel; Lakah, Lucien; Warolin, Christian J. M.; and Pascal, Yves R. A., 4,203,986, Cl. 424-250.000.

Passalenti, Beppino: *See—*
Vargiu, Silvio; Carpaneti, Edoardo; and Passalenti, Beppino, 4,203,816, Cl. 204-159.160.

Passingham, Roy J.: *See—*
Telling, Ronald C.; Passingham, Roy J.; Kitchener, Brian L.; and Hopkinson, David G., 4,203,801, Cl. 435-284.000.

Pasternak, Stephen F.: *See—*
O'Connor, Joseph M.; and Pasternak, Stephen F., 4,203,311, Cl. 72-254.000.

Patel, Dahyabhai M.: *See—*
Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; Patel, Dahyabhai M.; Won, Chong M.; and Alioto, Ronald L., 4,203,985, Cl. 424-249.000.

Patel, Raman: *See—*
Coran, Aubert Y.; and Patel, Raman, 4,203,884, Cl. 260-33.6AQ.

Patterson, Paul L., to Varian Associates, Inc. Thermionic detector. 4,203,726, Cl. 23-232.00E.

Paul, Frank W.: *See—*
Hart, Robert L.; Paul, Frank W.; and Sauer, Wolfgang J., 4,203,582, Cl. 269-32.000.

Pauly, John A.: *See—*
Parisi, Michael S.; and Pauly, John A., 4,204,186, Cl. 338-30.000.

Pavlovsky, Rudolf, to Georg Fischer Aktiengesellschaft. Machine for trimming castings. 4,203,183, Cl. 29-33.00A.

Peerless of America, Inc.: *See—*
O'Connor, Joseph M.; and Pasternak, Stephen F., 4,203,311, Cl. 72-254.000.

Peiffert, Jean; and Barbedienne, Roger S. Servo-control method and device. 4,204,146, Cl. 318-640.000.

Pellizzi, Anthony: *See—*
Stuff, Alfred; and Pellizzi, Anthony, 4,203,598, Cl. 273-77.00A.

Pelton, John F., to Union Carbide Corporation. Apparatus for refining molten aluminum. 4,203,581, Cl. 266-217.000.

Pennwalt Corporation: *See—*
Bafford, Richard A.; and Mageli, Orville L., 4,204,075, Cl. 568-562.000.
Warkentin, Aaron J.; and Hiebert, Jacob, 4,203,274, Cl. 53-537.000.

Perkin-Elmer Corporation, The: *See—*
DeBoynton, William L., 4,203,328, Cl. 74-25.000.

Perkins, Robert W., to Spiral Tubing Corporation. Corrugated tubing with variable depth corrugations and method of making the same. 4,203,312, Cl. 72-299.000.

Permenter, Marvin M., to Clinton Electronics Corporation. Cathode ray tube with laminated panel and method of making same. 4,204,231, Cl. 358-247.000.

Perrott, Francis C. Transportation systems. 4,203,369, Cl. 104-130.000.

Persson, Staffan B., to American Optical Corporation. Optical apparatus for varying focal power along one principal meridian while maintaining constant focal power along the other principal meridian. 4,203,651, Cl. 350-181.000.

Pery, Pierre; Luffau, Gerard; Poulain nee Charley, Joelle; and Petit, Agnes, to Institut National de la Recherche Agronomique. Coupling products of cytidine-diphosphocholine and amino-compounds for pharmaceutical use. 4,203,893, Cl. 260-121.000.

Peter, Julius; Johannsen, Peter; and Mauk, Gerhard, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,203,480, Cl. 152-209.0NT.

Peters, Arnis E., to Northern Engraving Company. Micro image cassette and viewer. 4,203,657, Cl. 353-26.00R.

Peters, Arnis E., to Northern Engraving Company. Micro image storage and retrieval apparatus. 4,203,658, Cl. 353-26.00R.

Peters, Leo: *See—*
Roth, Mario; Siemonsen, Hans-Peter; Schmidt, Gunther; Sonntag, Hubert; and Peters, Leo, 4,203,751, Cl. 65-106.000.

Peters, William J.: *See—*
Wolter, Karl E.; Peters, William J.; Roberts, Donald R.; McReynolds, Robert D.; Broomfield, Junior; and Crews, Ernest R., 4,203,253, Cl. 47-10.000.

Petersen, Gunnar C. Packaging apparatus. 4,203,269, Cl. 53-77.000.

Peterson, Jay B. Fishing lure holder. 4,203,245, Cl. 43-25.200.

Petit, Agnes: *See—*
Pery, Pierre; Luffau, Gerard; Poulain nee Charley, Joelle; and Petit, Agnes, 4,203,893, Cl. 260-121.000.

Phaal, Cornelius. Method of making an abrasive product. 4,203,732, Cl. 51-293.000.

Phillips, Donald M., to Westinghouse Electric Corp. Dual layer phosphor screen for cathode ray tube. 4,204,136, Cl. 313-473.000.

Phillips Petroleum Company: *See—*
Bellinger, Robert M.; and Gray, Michael L., 4,203,741, Cl. 62-24.000.
Stapp, Paul R., 4,203,865, Cl. 252-429.00R.
Stapp, Paul R., 4,203,927, Cl. 568-401.000.

Pickton, Shailer T.: *See—*
Williams, Stewart J.; and Pickton, Shailer T., 4,204,201, Cl. 340-521.000.

Pierce, Russell W.; Teppo, Edward A.; and Leet, Henry P., to United States of America, Navy. Covert recovery or signalling system. 4,203,667, Cl. 356-152.000.

Pierdet, Andre; Torelli, Vesperto; and Deraedt, Roger, to Roussel Uclaf. Novel 17 α-aryl-steroids. 4,203,981, Cl. 424-243.000.

Pierre, Michel: *See*—
Lesas, Claude H.; and Pierre, Michel, 4,204,054, Cl. 536-56.000.
Lesas, Claude H.; and Pierre, Michel, 4,204,055, Cl. 536-56.000.
Pieschke, Lawrence J. Baffle for gas heater vents. 4,203,356, Cl. 98-66.00R.
Pinnockchoice Limited: *See*—
Kurer, Peter F., 4,203,217, Cl. 433-220.000.
Pinsky, Gennady I.: *See*—
Krylov, Nikolai I.; Toder, Ilya A.; Sidorov, Oleg F.; Tarabaev, Gennady I.; and Pinsky, Gennady I., 4,203,310, Cl. 72-247.000.
Pinson, George T.; and Hunter, Alex B., to Boeing Company, The. Shock suppressing apparatus and method for a rocket launcher. 4,203,347, Cl. 89-1.816.
Pioneer Electronic Corporation: *See*—
Sato, Reisuke; and Yokogawa, Tomohisa, 4,204,169, Cl. 455-175.000.
Pistorius, Rudolf: *See*—
Konz, Elmar; and Pistorius, Rudolf, 4,204,076, Cl. 568-648.000.
Pitstick, Martin H., to General Electric Company. On/off switch arrangements for a touch control bar graph device. 4,204,204, Cl. 340-712.000.
Plamper, Gerhard R., to MTD Products Inc. Lawn mower and grass catcher. 4,203,276, Cl. 56-202.000.
Plastic-Craft, Inc.: *See*—
McAlister, George, 4,203,537, Cl. 222-570.000.
Plummer, William T., to Polaroid Corporation. Optical element for redistributing the light output of a photoflash lamp assembly or the like. 4,204,269, Cl. 362-17.000.
Podgorny, Anatoly N.; Varshavsky, Ilya L.; Solovei, Viktor V.; and Sinegubova, Elena V. Thermal absorption compressor. 4,203,711, Cl. 417-207.000.
Pointner, Martin: *See*—
Reichel, Hilmar; Klauke, Guenter; Herting, Karl-Heinz; and Pointner, Martin, 4,203,531, Cl. 228-1.00A.
Poirier d'Ange d'Orsay, Emmanuel H., to Societe pour l'Equipement de Vehicules. Method and apparatus for adjusting the orientation of vehicle headlights. 4,204,270, Cl. 362-71.000.
Polaroid Corporation: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,204,061, Cl. 260-243.300.
Bourgeois, Gerard J.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,203,766, Cl. 430-243.000.
Cohen, Frederic S.; and Hyland, Albert L., 4,204,036, Cl. 429-152.000.
McElwaine, David C., 4,203,656, Cl. 352-194.000.
Plummer, William T., 4,204,269, Cl. 362-17.000.
Stella, Joseph A.; and Mason, Paul B., 4,203,655, Cl. 352-78.00R.
Pollich, Gerhard, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet-fed rotary printing machine. 4,203,361, Cl. 101-177.000.
Polygraph Leipzig Kombinat fuer Polygraphiscje Maschinen und Ausrustungen: *See*—
Walter, Siegfried; Schneider, Michael; and Nagel, Hartmut, 4,203,363, Cl. 101-409.000.
Ponlot, Jacques: *See*—
Ponlot, Victor; and Ponlot, Jacques, 4,203,463, Cl. 137-403.000.
Ponlot, Victor; and Ponlot, Jacques. Flow-regulating device for perfusion-transfusion apparatus. 4,203,463, Cl. 137-403.000.
Porta Systems Corp.: *See*—
De Luca, Paul V.; and Gautier, Charles L., 4,204,095, Cl. 179-98.000.
Portenart, Michel C.: *See*—
Delmon, Bernard M.; Portenart, Michel C.; and Viehe, Heinz, 4,203,917, Cl. 260-465.00B.
Portescap: *See*—
Beguin, Pierre, 4,203,281, Cl. 368-124.000.
Potier, M. Pierre, to Saint-Gobain Industries. Apparatus for bending glass sheets. 4,203,754, Cl. 65-273.000.
Poulain nee Charley, Joelle: *See*—
Pery, Pierre; Luffau, Gerard; Poulain nee Charley, Joelle; and Petit, Agnes, 4,203,893, Cl. 260-121.000.
PPG Industries, Inc.: *See*—
Donley, Harold E., 4,204,028, Cl. 428-432.000.
Nielsen, Donald R., 4,203,870, Cl. 252-459.000.
Prahl, Gertraud, to A. Nattermann & Cie. GmbH. Spreading device for treatment of hip dysplasties. 4,203,433, Cl. 128-80.00A.
Prakla-Seismos GmbH: *See*—
Weichart, Helmut; and Schmidt, Jurgen, 4,204,188, Cl. 340-7.00R.
Priese, Werner K., to Hills-McCanna Company. Ball valve with compound closure movement. 4,203,460, Cl. 137-240.000.
Procter & Gamble Company, The: *See*—
Leveckis, Algis S.; and Gelman, Stephanie S., 4,204,105, Cl. 219-10.55E.
Proffit, Daniel S.; and Regignano, Maurice, to General Electric Company. Heat transfer mounting arrangement for a solid state device connected to a circuit board. 4,204,248, Cl. 361-388.000.
Proksch, Emil: *See*—
Knotik, Karl; Leichter, Peter; Proksch, Emil; and Huschka, Hans, 4,203,863, Cl. 252-301.10W.
Proulx, Raymond E. Flail feedout mechanism for a rotary mower. 4,203,212, Cl. 30-276.000.
Pryor, Edward G.: *See*—
Loshbough, Richard C.; and Pryor, Edward G., 4,204,197, Cl. 340-347.0NT.
Pupp, Herwig; and Andersson, Birger O., to AB Ziristor. Machine for the manufacture of packing containers. 4,203,795, Cl. 156-446.000.
Puryear, John W., to Brunswick Corporation. Fishing reel spool locking knob. 4,203,565, Cl. 242-84.10R.
Pye, Richard T., to Harvey Hubbell, Incorporated. Electrical insulation composition having low power factor. 4,204,024, Cl. 428-379.000.
Quatkemeyer, Tony. Horseshoe type game device. 4,203,592, Cl. 273-336.000.
Quick, Thomas R. Faucet stem nut splitter. 4,203,211, Cl. 30-272.00R.
Quigley, Thomas J., to Stackpole Components Company. Slide switch. 4,204,104, Cl. 200-164.00R.
Racal Communications Equipment Limited: *See*—
King, Nigel J. R., 4,204,174, Cl. 331-10.000.
Radici, Pierino: *See*—
Colombo, Paolo; and Radici, Pierino, 4,203,735, Cl. 55-26.000.
Radkevich, Alexei V.: *See*—
Goriletsky, Valentin I.; Mjulendorf, Oleg S.; Radkevich, Alexei V.; and Eidelman, Lev G., 4,203,951, Cl. 422-249.000.
Radzun, Bruno. Electric pendulum clock with torsion spring. 4,203,282, Cl. 368-180.000.
Rainin, Edgar A.; and Major, Emery, to Rainin, Edgar A. Intraocular lens. 4,203,168, Cl. 3-13.000.
Raley, Garland E.; Miller, C. W.; and Smith, D. L., to Ethyl Corporation. Rotating joint for extrusion die. 4,203,715, Cl. 425-131.100.
Ramachandran, Pallassana N., to Colgate-Palmolive Company. Fabric softening compositions and methods for manufacture thereof. 4,203,851, Cl. 252-8.600.
Ramer, James L. Method for operating a rotary engine. 4,203,410, Cl. 123-205.000.
Ramey, Chester E.; and Luzzi, John L., to Ciba-Geigy Corporation. Hindered piperidine carboxylic acids, metal salts thereof and stabilized compositions. 4,203,890, Cl. 260-45.80N.
Rampolla, Robert W.: *See*—
Baldwin, Gary D.; and Rampolla, Robert W., 4,204,175, Cl. 331-94.50D.
Ramseier & Jenzer AG, Carosseriewerke Bern: *See*—
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, 4,203,623, Cl. 296-178.000.
Ranik, William J., Jr., to Firestone Tire & Rubber Company, The. Pneumatic tire, rim and combination thereof. 4,203,481, Cl. 152-330.0RF.
Rapistan Incorporated: *See*—
Sapila, Martin B., 4,203,370, Cl. 104-162.000.
Raquet, Erwin; Tacke, Gerhard; and Heller, Wilhelm, to Fried. Krupp Huttenwerke AG. Oscillation dampening system for a railway track. 4,203,546, Cl. 238-1.000.
Rashbrook, Robert B., to ICI Americas Inc. Polyester films. 4,203,888, Cl. 260-45.70P.
Rathbun, Donald J.: *See*—
Getson, Edward F., Jr.; Kelley, John H.; McLaughlin, Albert T.; and Rathbun, Donald J., 4,204,250, Cl. 364-200.000.
Raudat, John L., to Standard-Knapp, Inc. Indexing apparatus for case packer. 4,203,271, Cl. 53-250.000.
Ravagnani, Frederick J.: *See*—
Halasa, Adel F.; Ravagnani, Frederick J.; and Schonfeld, Steven E., 4,203,874, Cl. 260-3.000.
Rawson, Francis F. H., to USM Corporation. Method and mechanism for applying thermoplastic heels to shoes. 4,203,189, Cl. 29-432.000.
RCA Corporation: *See*—
Ahmed, Adel A. A., 4,204,133, Cl. 307-310.000.
Aschwanden, Felix, 4,204,173, Cl. 331-1.00A.
Goodman, Lawrence A., 4,204,217, Cl. 357-23.000.
Gurley, Thomas M., 4,204,227, Cl. 358-138.000.
Hawrylo, Frank Z., 4,203,785, Cl. 148-171.000.
Larrabee, Robert D., 4,204,147, Cl. 323-4.000.
Rutishauser, Ernst A. O., 4,204,220, Cl. 358-8.000.
Shanley, Robert L., II, 4,204,221, Cl. 358-34.000.
Sutphin, Eldon M., Jr., 4,204,171, Cl. 328-167.000.
Ready, Patrick J., to Typoligics, Inc. Multichannel coherent receiver. 4,204,165, Cl. 455-226.000.
Reed, Charles J., to GTE Automatic Electric Laboratories Incorporated. Pneumatic diverter for hybrid thick film substrate processing equipment. 4,203,510, Cl. 198-437.000.
Reedhead, Frederick W.; Reedhead, Rowland E.; and Reynolds, George W. Throatless tennis racquet. 4,203,597, Cl. 273-73.00E.
Reedhead, Rowland E.: *See*—
Reedhead, Frederick W.; Reedhead, Rowland E.; and Reynolds, George W., 4,203,597, Cl. 273-73.00E.
Refuse Derived Fuels (London) Limited: *See*—
Hood, Peter, 4,203,376, Cl. 110-346.000.
Regie Nationale des Usines Renault: *See*—
Fabreges, Michel, 4,203,632, Cl. 303-100.000.
Regignano, Maurice: *See*—
Proffit, Daniel S.; and Regignano, Maurice, 4,204,248, Cl. 361-388.000.
Reichard, Michel: *See*—
Luscan, Bernard; and Reichard, Michel, 4,203,284, Cl. 60-245.000.
Reichel, Hilmar; Klauke, Guenter; Herting, Karl-Heinz; and Pointner, Martin, to Siemens Aktiengesellschaft. Ultrasonic soldering bath having an ultrasonic probe extending into the solder bath. 4,203,531, Cl. 228-1.00A.
Reichert, Dieter. Anti-theft switch for vehicles. 4,204,100, Cl. 200-52.00R.
Reinhardt, Hans; and Kuylenstierna, Ulf V., to MX-Processer Reinhardt & Co. AB. Re-extracting metal chloride complex from an organic extraction solution. 4,203,964, Cl. 423-658.500.
Reisberg, Joseph, to Shell Oil Company. Chemical flood oil recovery with highly saline reservoir water. 4,203,491, Cl. 166-274.000.

Reiter, Gerhard, to Timken Company, The. Wheel mounting and tapered roller bearing therefor. 4,203,635, Cl. 308-213.000.
Reliance Electric Company: *See—*
Loshbough, Richard C.; and Pryor, Edward G., 4,204,197, Cl. 340-347.0NT.
Respen, Yves J.: *See—*
Economopoulos, Marios; and Respen, Yves J., 4,203,783, Cl. 148-12.400.
Rex-Rotary International/A.S.: *See—*
Zeuthen, Karl G., 4,203,533, Cl. 222-241.000.
Reyniers, Albert A.: *See—*
Claeys, Danie A.; Reyniers, Albert A.; and Janssens, Wilhelmus, 4,203,765, Cl. 430-252.000.
Reynoir Company, The: *See—*
Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., 4,203,504, Cl. 182-10.000.
Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., to Reynoir Company, The. Method and system for escaping from an offshore drilling platform. 4,203,504, Cl. 182-10.000.
Reynolds, George W.: *See—*
Reedhead, Frederick W.; Reedhead, Rowland E.; and Reynolds, George W., 4,203,597, Cl. 273-73.00E.
Reynolds, Richard N., Jr., to Chevron Research Company. Alkylation of aniline with a lactone in the presence of a base. 4,203,904, Cl. 260-343.600.
Rheem Manufacturing Company: *See—*
Coffey, Rufus G., 4,203,335, Cl. 83-232.000.
Rhodes, John M.: *See—*
Luke, Roger D.; and Rhodes, John M., 4,204,245, Cl. 361-358.000.
Rhone-Poulenc-Textile: *See—*
Isoard, Bernard, 4,203,560, Cl. 242-45.000.
Ribka, Joachim: *See—*
Muller, Rolf; and Ribka, Joachim, 4,204,056, Cl. 542-416.000.
Riboulet, Michel J.; and Segui, Gerard R., to Centre National d'Etudes Spatiales. Process and apparatus for the measurement of the factor of infra-red absorption or emission of materials. 4,204,120, Cl. 250-341.000.
Ricci, Donald C., to Sno-Go Inc. Vehicle safety device. 4,203,423, Cl. 126-271.100.
Richards, James S.: *See—*
Montgomery, John R.; and Richards, James S., 4,203,342, Cl. 84-293.000.
Richmon, Sidney. Elevator control. 4,203,506, Cl. 187-29.00R.
Rickard, Lawrence C. Compound archery bow. 4,203,412, Cl. 124-23.00R.
Ricoh Company, Ltd.: *See—*
Ogura, Masaaki; Seko, Nachio; and Yano, Takato, 4,203,663, Cl. 355-14.00C.
Ricouard, Jean-Pierre; and Schorter, Bruno, to U.S. Philips Corporation. Hall effect position detector using a single permanent magnet. 4,204,158, Cl. 324-208.000.
Riken Corporation: *See—*
Takemura, Kazutoshi; Oda, Takashi; and Kiyota, Fumio, 4,204,031, Cl. 428-539.500.
Rinaldo, James D.: *See—*
Bubula, Thomas J.; Franz, Maurice F.; Johnson, Gordon W.; and Rinaldo, James D., 4,203,293, Cl. 60-490.000.
Rissi, Paul, to General Motors Corporation. Precision pressure control valve. 4,203,465, Cl. 137-487.500.
Ritchie, Leon T.: *See—*
Desso, Jerome A.; Ritchie, Leon T.; and Yeager, Marvin L., 4,203,646, Cl. 339-205.000.
Rivetti, Enrico; Amedei, Giuseppe; and Bertone, Antonino, to Centro Richerche Fiat S.p.A. Hydraulic servo-assisted braking system for motor vehicles. 4,203,631, Cl. 303-52.000.
Roberson, Walter H., Sr. Closure plug assembly. 4,203,473, Cl. 138-93.000.
Robert Bosch GmbH: *See—*
Klotzner, Winfried, 4,204,256, Cl. 364-431.000.
Robert Finke Kunststoff-Spritzguss-Werk: *See—*
Finke, Klaus W., 4,203,534, Cl. 222-402.130.
Roberts, Donald R.: *See—*
Wolter, Karl E.; Peters, William J.; Roberts, Donald R.; McReynolds, Robert D.; Broomfield, Junior; and Crews, Ernest R., 4,203,253, Cl. 47-10.000.
Robinson, Graham E.: *See—*
Bowler, Jean; and Robinson, Graham E., 4,204,001, Cl. 424-308.000.
Robinson, John W.: *See—*
Welsh, Alan B.; and Robinson, John W., 4,203,339, Cl. 84-1.190.
Robinson, Peter J.: *See—*
Lautenschlager, Eugene P.; Robinson, Peter J.; and Vitek, Randall M., 4,203,223, Cl. 433-75.000.
Rock, Gail A. Method of collecting anti-hemophilic factor VIII from blood and blood plasma using heparin or sodium heparin. 4,203,891, Cl. 260-112.00B.
Rockwell International Corporation: *See—*
Brown, Kenneth L., 4,204,168, Cl. 455-330.000.
Rodale Resources, Inc.: *See—*
Gasper, Martin J., Jr.; and Black, Theodore W., 4,203,389, Cl. 119-3.000.
Rogers, Peter R., to Cam Gears Limited. Ball joints. 4,203,683, Cl. 403-132.000.
Rohde, Wolfgang: *See—*
Meckel, Joachim F.; Rohde, Wolfgang; Siebert, Werner; Wagener, Dietrich; Flockenhaus, Claus; and Galow, Manfred, 4,203,803, Cl. 201-40.000.
Rohm and Haas Company: *See—*
Kirn, William A.; and Gehman, David R., 4,203,859, Cl. 252-174.230.
Roldan, Cristobal M.: *See—*
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; and Fernandez de Gamboa, Cristina R., 4,204,063, Cl. 546-99.000.
Rollmann, Louis D.; and Walsh, Dennis E., to Mobil Oil Corporation. Visbreaking process for demetalation and desulfurization of heavy oil. 4,203,830, Cl. 208-236.000.
Rollmann, Louis D., to Mobil Oil Corporation. ZSM-5 Containing aluminum-free shells on its surface. 4,203,869, Cl. 252-455.00Z.
Roma, Pierpaolo: *See—*
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, 4,203,882, Cl. 260-28.50A.
Rose, Robert N., to LeMay, Robert C.; Mills, Earl G.; Stackpole, Chester S.; and Massey, Harold, part interest to each. Process of smelting with submerged burner. 4,203,761, Cl. 75-40.000.
Rosen, Perry: *See—*
Holland, George W.; and Rosen, Perry, 4,204,074, Cl. 562-503.000.
Rosier, William R.: *See—*
United States of America, National Aeronautics and Space Administration; Rosier, William R.; and Volk, George G., 4,204,154, Cl. 324-51.000.
Ross, Anthony J. Polarity indicating and reversing unit. 4,204,243, Cl. 361-245.000.
Rossner, Heinrich-Otto; and Seelig, Henri F., to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for producing steel from sponge metal by using a gas plasma. 4,203,760, Cl. 75-12.000.
Roth, Mario; Siemonsen, Hans-Peter; Schmidt, Gunther; Sonntag, Hubert; and Peters, Leo, to Saint-Gobain Industries. Method and apparatus for making convex sheets of glass having a small radius of curvature. 4,203,751, Cl. 65-106.000.
Roussel Uclaf: *See—*
Pierdet, Andre; Torelli, Vesperto; and Deraedt, Roger, 4,203,981, Cl. 424-243.000.
Roy, Ashutosh, to Thorn Electrical Industries Limited. Fluorescent lamp with refractory metal electrode supports and glass flare seal structure. 4,204,137, Cl. 313-491.000.
Roy, Ram B., to Technicon Instruments Corporation. Stabilized reagents. 4,203,921, Cl. 260-553.00A.
Rubbright, Harry A.; and Springer, Donald A., to Anchor Hocking Corporation. Food preparation apparatus and process. 4,203,486, Cl. 165-48.00R.
Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. Inhibitable enzyme amplification assay. 4,203,802, Cl. 435-188.000.
Rubin, Harry S.: *See—*
Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., 4,203,659, Cl. 353-120.000.
Ruchser, Erich, to Herion-Werke KG. Multiway switching valve. 4,203,571, Cl. 251-31.000.
Ruckstuhl, Konrad. Method of and apparatus for treating waste materials. 4,203,755, Cl. 71-9.000.
Rudolph, Frank W.: *See—*
Mead, Ralph T.; Greatbatch, Wilson; Rudolph, Frank W.; and Frenz, Norbert W., Jr., 4,203,201, Cl. 29-623.100.
Ruszala, Frederick B.; and Cook, Kenneth J., to Valeron Corporation, The. Complex analog signal generator. 4,204,261, Cl. 364-607.000.
Rutishauser, Ernst A. O., to RCA Corporation. Dual standard video disc player. 4,204,220, Cl. 358-8.000.
Rybicki, Robert C., to United Technologies Corporation. Elastomeric rotor load reaction system. 4,203,708, Cl. 416-134.00A.
Ryerson, Joseph L., to Energy for Independence, Inc. Ozone detecting element. 4,203,946, Cl. 422-98.000.
S. A. Beghin-Say: *See—*
Lesas, Claude H.; and Pierre, Michel, 4,204,054, Cl. 536-56.000.
Lesas, Claude H.; and Pierre, Michel, 4,204,055, Cl. 536-56.000.
Sabourin, Edward T.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for the preparation of nitrophenyl hydroxy substituted acetylenes. 4,204,078, Cl. 568-705.000.
Sacharnoski, Max, Sr. Fishing lure sound producer. 4,203,246, Cl. 43-42.310.
Sahatjian, Ronald A.: *See—*
Bourgeois, Gerard J.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,203,766, Cl. 430-243.000.
Saint-Amand, Henri, to Etudes Techniques et Representations Industrielles E.T.R.I. Electric fan and especially a fan of the flat type. 4,203,704, Cl. 416-93.00R.
Saint-Gobain Industries: *See—*
Battigelli, Jean A.; and Bouquet, Francois, 4,203,745, Cl. 65-6.000.
Battigelli, Jean A.; Bouquet, Francois; Fezenko, Igor; and Massol, Jean-Jacques, 4,203,746, Cl. 65-6.000.
Battigelli, Jean A.; Bouquet, Francois; and Fezenko, Igor, 4,203,748, Cl. 65-14.000.
Battigelli, Jean A.; Bouquet, Francois; and Massol, Jean-Jacques, 4,203,774, Cl. 106-50.000.
Fezenko, Igor, 4,203,747, Cl. 65-6.000.
Laine, Jean-Claude, 4,203,749, Cl. 65-68.000.
Potier, M. Pierre, 4,203,754, Cl. 65-273.000.
Roth, Mario; Siemonsen, Hans-Peter; Schmidt, Gunther; Sonntag, Hubert; and Peters, Leo, 4,203,751, Cl. 65-106.000.

Saito, Yoshio; Shibata, Yoshio; and Fujiie, Satosi, to Tokico, Ltd. Automatic shut off dispensing nozzle. 4,203,478, Cl. 141-206.000.
Saitou, Setsuo: *See*—
Shimizu, Norio; Odawara, Youji; Yamaguchi, Tetsuo; Saitou, Setsuo; Nakaoka, Azuma; and Ichihashi, Kazuaki, 4,203,841, Cl. 210-205.000.
Sakai, Akira; and Matsumura, Jube, to Hitachi, Ltd. Governing system for use in sliding-pressure type turbine power plant. 4,203,297, Cl. 60-660.000.
Sakakura, Tatsuo R.: *See*—
Coggin, Charles H., Jr.; and Sakakura, Tatsuo R., 4,203,559, Cl. 242-18.00G.
Sakashita, Nobuyuki: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Shigehara, Itaru; and Sakashita, Nobuyuki, 4,203,758, Cl. 71-100.000.
Sakurai, Kenji: *See*—
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Sally, Theodore J.: *See*—
Morris, Earl L.; Hafner, Walter V.; and Sally, Theodore J., 4,203,173, Cl. 4-427.000.
Samibem, S.A.: *See*—
Kaetzel, Pierre, 4,203,277, Cl. 56-377.000.
Sanchez, Richard E. Automotive vehicle speed arrestor. 4,203,685, Cl. 404-6.000.
Sanders, Frederick W., to Mead Corporation, The. Production of pressure-sensitive carbonless record sheets using alkane dioic acid hot melt systems and products thereof. 4,203,619, Cl. 282-27.500.
Sandford, Geoffrey P. Railway sleeper. 4,203,549, Cl. 238-111.000.
Sandner, Helmut G.: *See*—
Grossa, Mario; and Sandner, Helmut G., 4,203,770, Cl. 430-270.000.
Sanne, Oddmund, to Sanne & Wendel A/S. Safety valve for gas pipes. 4,203,470, Cl. 137-625.460.
Sanne & Wendel A/S: *See*—
Sanne, Oddmund, 4,203,470, Cl. 137-625.460.
Sanyo Electric Co., Ltd.: *See*—
Araki, Itiro, 4,204,166, Cl. 455-289.000.
Sanz, Antonio M.: *See*—
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; and Fernandez de Gamboa, Cristina R., 4,204,063, Cl. 546-99.000.
Sapila, Martin B., to Rapistan Incorporated. In-floor towline automatic re-entry spur. 4,203,370, Cl. 104-162.000.
Saran Industries, Inc.: *See*—
Fogle, James W., 4,203,214, Cl. 30-355.000.
Sarian, Suren; and Johnson, Duane P. Eddy-current test probe with segmented circumferential test gap and method for inspection of materials. 4,204,159, Cl. 324-232.000.
Sato, Reisuke; and Yokogawa, Tomohisa, to Pioneer Electronic Corporation. Muting circuit in an electronic tuning type receiver. 4,204,169, Cl. 455-175.000.
Sato, Takahisa: *See*—
Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, 4,203,906, Cl. 260-346.400.
Satoh, Shin: *See*—
Suganuma, Tsuneo; Ishida, Koji; Satoh, Shin; Sugie, Mamoru; Katsuyama, Toshio; and Toda, Gyozo, 4,203,743, Cl. 65-3.00A.
Sauer, Wolfgang J.: *See*—
Hart, Robert L.; Paul, Frank W.; and Sauer, Wolfgang J., 4,203,582, Cl. 269-32.000.
Saunders, Robert M.; and Kohler, George O., to United States of America, Agriculture. Preparation of protein concentrates from whey and seed products. 4,204,008, Cl. 426-583.000.
Sawada, Fred H.; and Howenstein, Melvin, to General Electric Company. Apparatus for aligning brushes of a dynamoelectric machine. 4,204,156, Cl. 324-158.0MG.
Sawada, Toyoaki: *See*—
Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, 4,204,044, Cl. 435-280.000.
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, to Mitsubishi Chemical Industries Limited. Method and apparatus for the measurement of antigens and antibodies. 4,203,724, Cl. 23-230.00B.
Sawyer, Edgar W., Jr., to International Telephone and Telegraph Corporation. Method of forming low temperature dispersions. 4,203,864, Cl. 252-314.000.
Scandinavian Lancers Aktiebolag: *See*—
Johnsson, M. K. Olof; Oberg, Karl-Erik; and Bertheussen, Harry, 4,203,763, Cl. 75-129.000.
Scarpiello, Daniel A., to SCM Corporation. Process for conjugating unconjugated unsaturation of fatty acids or esters thereof. 4,203,911, Cl. 260-405.600.
Schaefer Corporation: *See*—
Gill, Harnek S.; and Turner, Charles R., 4,203,301, Cl. 62-131.000.
Schaefer, Klaus: *See*—
Gast, Uwe; Kiralfy, Dennis; Schaefer, Klaus; Slawik, Eckhard; and Wellendorf, Klaus, 4,204,223, Cl. 358-80.000.
Schaer, Glenn R., to Battelle Memorial Institute. Electrochemical cell. 4,204,034, Cl. 429-54.000.
Schaubert, Daniel H.: *See*—
Sindoris, Arthur R.; Farrar, Frederick G.; and Schaubert, Daniel H., 4,204,212, Cl. 343-700.0MS.
Scheffler, Glenn W.; and Tanrikut, Yasar, to United Technologies Corporation. Staged vaporization of liquid hydrocarbon fuels. 4,203,963, Cl. 423-650.000.
Scheibitz, Wolfgang: *See*—
Schroter, Klaus; Scheibitz, Wolfgang; and Ehlers, Klaus-Peter, 4,203,956, Cl. 423-321.00S.
Scheidler, Herwig: *See*—
Kiefer, Werner; Krause, Dieter; Scheidler, Herwig; Schulze, Hans-Wilhelm; and Kristen, Klaus, 4,203,264, Cl. 52-1.000.
Schenker, Barry A.; Sugano, Thomas T.; Stillman, Neil W.; and O'Leary, Kevin J., to Diamond Shamrock Corporation. Method of producing sols by electrodialysis. 4,203,822, Cl. 204-301.000.
Scheppele, Lyle W., to Toledo Stamping & Manufacturing Company. Metering apparatus. 4,203,513, Cl. 198-620.000.
Schleicher GmbH & Co. Relais-Werke KG: *See*—
Metzner, Gerd L., 4,204,242, Cl. 361-198.000.
Schleppy, Ronald, Jr.: *See*—
Carr, Norman L.; Schleppy, Ronald, Jr.; Schmid, Bruce K.; and Shah, Yatish T., 4,203,823, Cl. 208-10.000.
Schlick, Erich: *See*—
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Schlussel, Peter F.: *See*—
Hofert, Wilhelm A.; Schlussel, Peter F.; Sutor, Anton H.; and Ullrich, Georg J., 4,203,446, Cl. 128-329.00R.
Schmid, Bruce K.: *See*—
Carr, Norman L.; Schleppy, Ronald, Jr.; Schmid, Bruce K.; and Shah, Yatish T., 4,203,823, Cl. 208-10.000.
Schmidt, Gunther: *See*—
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Schmidt, Jurgen: *See*—
Weichart, Helmut; and Schmidt, Jurgen, 4,204,188, Cl. 340-7.00R.
Schmit, John W. Lockable covering apparatus for telephone dials. 4,204,097, Cl. 179-189.00D.
Schmoock, Roy F., to Fischer & Porter Co. High-voltage impulse driver for electromagnetic flowmeter. 4,204,240, Cl. 361-152.000.
Schnall, Gunther: *See*—
Blochl, Hanns; Fryda, Georg; Schlick, Erich; and Schnall, Gunther, 4,203,386, Cl. 118-653.000.
Schneider, Louis; and Graham, David E., to GAF Corporation. Process for making N-(N'-methylenepyrrolidonyl)-2-substituted anilines. 4,203,901, Cl. 260-326.50S.
Schneider, Michael: *See*—
Walter, Siegfried; Schneider, Michael; and Nagel, Hartmut, 4,203,363, Cl. 101-409.000.
Schneiter, Ali: *See*—
Ziegler, Jacques; Schneiter, Ali; and Grandjean, Remy, 4,203,280, Cl. 368-187.000.
Schneiter, Fred E.: *See*—
Kirchoff, George F.; and Schneiter, Fred E., 4,203,787, Cl. 149-35.000.
Schnitzer, Johann G. Cereal mill. 4,203,558, Cl. 241-247.000.
Schoenfelder, James L. Portable solar heat tube. 4,203,420, Cl. 126-426.000.
Schonfeld, Steven E.: *See*—
Halasa, Adel F.; Ravagnani, Frederick J.; and Schonfeld, Steven E., 4,203,874, Cl. 260-3.000.
Schoppe, Gunter: *See*—
Schutt, Wolfgang; Jensen, Hans-Ludwig; Eberlein, Werner; and Schoppe, Gunter, 4,203,817, Cl. 204-180.00R.
Schorter, Bruno: *See*—
Ricouard, Jean-Pierre; and Schorter, Bruno, 4,204,158, Cl. 324-208.000.
Schroeder, Eugene N., to International Business Machines Corporation. Adaptive alignment for pattern recognition system. 4,204,193, Cl. 340-146.30H.
Schrooder, Rolf: *See*—
Stemme, Otto; Lermann, Peter; Schrooder, Rolf; and Karl, Horst, 4,203,662, Cl. 354-173.000.
Schroter, Klaus; Scheibitz, Wolfgang; and Ehlers, Klaus-Peter, to Hoechst Aktiengesellschaft. Process and apparatus for recovering alcoholic phosphoric acid solutions from acid phosphates. 4,203,956, Cl. 423-321.00S.
Schulte-Elte, Karl-Heinrich: *See*—
Cookson, Richard C.; Schulte-Elte, Karl-Heinrich; and Hauser, Arnold, 4,203,907, Cl. 260-346.110.
Schults, Neal. Automatic swimming pool cover and cover washer. 4,203,174, Cl. 4-172.000.
Schultz, Curtis L.; and Guntly, Thomas G., to Tecumseh Products Company. Primer. 4,203,405, Cl. 123-187.50R.
Schultz, Peter C.; and Wusirika, Raja R., to Corning Glass Works. Method of making nitrogen-doped graded index optical waveguides. 4,203,744, Cl. 65-3.00A.
Schultz, William G., to United States of America, Agriculture. Method of removing pigment from annatto seed. 4,204,043, Cl. 435-267.000.
Schulze, Hans-Wilhelm: *See*—
Kiefer, Werner; Krause, Dieter; Scheidler, Herwig; Schulze, Hans-Wilhelm; and Kristen, Klaus, 4,203,264, Cl. 52-1.000.
Schurz Corporation: *See*—
Dietz, William A., 4,203,468, Cl. 137-624.110.
Schuster, Samuel J. Receptacle for receiving articles for storage in sterilized condition. 4,203,520, Cl. 206-439.000.
Schuster, Waldemar; and Hohn, Max G. Piston for multi-stage operation. 4,203,352, Cl. 92-94.000.
Schutt, Wolfgang; Jensen, Hans-Ludwig; Eberlein, Werner; and Schoppe, Gunter, to JENOPTIK JENA G.m.b.H. Method of and device for moving liquid samples. 4,203,817, Cl. 204-180.00R.

Schwartz, Harold O.; and Kidd, Dennis E., to Wurlitzer Company, The. Large scale integrated circuit chip for an electronic organ. 4,203,337, Cl. 84-1.010.
Schwartz, Jerome; and Levitt, Joseph, to Taylor Lock Company. Duplicating machine for tubular keys. 4,203,693, Cl. 409-81.000.
Schwarzer, Siegfried: *See*—
Becker, Kurt; Buogert, Hermann; Schwarzer, Siegfried; and Seidel, Hans-Georg. 4,203,752, Cl. 65-163.000.
Schweitzer, Karl: *See*—
Zimmer, Peter; Kudlich, Hans; Schweitzer, Karl; and Mayr, Walter, 4,203,554, Cl. 239-585.000.
Schwemm, Gene: *See*—
DeLuca, Raymond F.; and Schwemm, Gene, 4,203,562, Cl. 242-55.300.
Schwind, Heinz G., to Griesel B.V. Fluid motor actuator for rotating a shaft back and forth. 4,203,351, Cl. 92-69.00R.
Schwitters, Stephen W., to Beatrice Foods Co. Freezer door for a soft-serve freezer. 4,203,461, Cl. 137-343.000.
SCM Corporation: *See*—
Bledsoe, James O., Jr.; and Cardenas, Carlos G., 4,204,080, Cl. 585-273.000.
Scarpiello, Daniel A., 4,203,911, Cl. 260-405.600.
Scope Data Incorporated: *See*—
Nordstrom, Larry A.; and Szechy, Daniel J., 4,203,678, Cl. 400-320.000.
Scruggs, David M. Hoist motor control system. 4,204,142, Cl. 318-257.000.
Sea Horse Corporation, The: *See*—
Sumner, Maurice N., 4,203,687, Cl. 405-170.000.
Sears, Roebuck and Co.: *See*—
Gall, John C.; Ozimek, Chester E.; and Chamberlain, Albert E., 4,203,681, Cl. 400-697.000.
Sebok, Antal: *See*—
Kraxner, Istvan; Sebok, Antal; Steiner, Janos; and Toth, Jozsef, 4,203,689, Cl. 406-123.000.
Sederquist, Richard A., to United Technologies Corporation. Steam reforming reactor designed to reduce catalyst crushing. 4,203,950, Cl. 422-197.000.
Seeburn Metal Products Limited: *See*—
Margueratt, Oatway, 4,203,578, Cl. 254-109.000.
Seelig, Henri F.: *See*—
Rossner, Heinrich-Otto; and Seelig, Henri F., 4,203,760, Cl. 75-12.000.
Segui, Gerard R.: *See*—
Riboulet, Michel J.; and Segui, Gerard R., 4,204,120, Cl. 250-341.000.
Sehlbach, Gerd; and Klischat, Ditmar, to Gelenkwellenbau GmbH. Telescoping power take-off shaft with lockable length adjustment. 4,203,306, Cl. 64-23.000.
Seidaliev, Fikrat S. O.: *See*—
Ermakov, Vladimir E.; Makarov, Viktor B.; Seidaliev, Fikrat S. O.; Nikiforov, Alexandr M.; Bushev, Alexandr V.; and Dozortsev, July K., 4,203,309, Cl. 72-96.000.
Seidel, Hans-Georg: *See*—
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Seidler, Helmut: *See*—
Hohmann, Walter; Wunderlich, Klaus; and Seidler, Helmut, 4,203,885, Cl. 260-369.000.
Seidler, Jack, to North American Specialties Corp. Solder bearing terminal. 4,203,648, Cl. 339-275.00T.
Seki, Kazuo: *See*—
Kojima, Tadashi; and Seki, Kazuo, 4,203,779, Cl. 136-233.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Noda, Yoichiro; Matsumura, Michio; Chiba, Norio; and Hata, Masahito, 4,203,815, Cl. 204-159.200.
Seko, Nachio: *See*—
Ogura, Masaaki; Seko, Nachio; and Yano, Takato, 4,203,663, Cl. 355-14.00C.
Selwitz, Charles M.: *See*—
Sabourin, Edward T.; and Selwitz, Charles M., 4,204,078, Cl. 568-705.000.
Seme, Joseph P., Sr. Articulating part handling device. 4,203,700, Cl. 414-732.000.
SEPCO Corporation: *See*—
Gibson, Vernon W., Sr., 4,203,191, Cl. 29-451.000.
Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See*—
Leclerc, Jean-Francois; and Waegaert, Pierre, 4,203,453, Cl. 131-20.00R.
Shah, Yatish T.: *See*—
Carr, Norman L.; Schleppy, Ronald, Jr.; Schmid, Bruce K.; and Shah, Yatish T., 4,203,823, Cl. 208-10.000.
Shanley, Robert L., II, to RCA Corporation. Predictably biased kinescope driver arrangement in a video signal processing system. 4,204,221, Cl. 358-34.000.
Shapiro, Sol: *See*—
Underwood, James L.; and Shapiro, Sol, 4,203,362, Cl. 101-327.000.
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, to Zavod Stroitelnykh Mashin. Method of unloading bulk materials from vessels. 4,203,688, Cl. 406-85.000.
Sharp Kabushiki Kaisha: *See*—
Nakarai, Masazumi, 4,204,215, Cl. 346-140.00R.
Shaw, David H.: *See*—
Achia, Biddanda U.; and Shaw, David H., 4,203,824, Cl. 208-33.000.
Shay, George C., to Corning Glass Works. Manufacture of flat glass. 4,203,750, Cl. 65-99.00A.
Sheldon, Edward E. Apparatus for producing X-ray images by electrical charges. 4,204,118, Cl. 250-315.200.
Shell Oil Company: *See*—
Bauer, Ronald S., 4,203,878, Cl. 260-18.0EP.
Reisberg, Joseph, 4,203,491, Cl. 166-274.000.
Shelter Insulation, Inc.: *See*—
Parker, Lawrence J., 4,204,019, Cl. 428-310.000.
Shennett, George D., Jr., to Gould Inc. Device for inserting a fuse into an electric circuit. 4,203,645, Cl. 339-147.00R.
Sheridan, Earl A., to Bendix Corporation, The. Brake booster. 4,203,349, Cl. 91-47.000.
Shibamoto, Norio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,204,038, Cl. 435-78.000.
Shibata, Yoshio: *See*—
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Shigehara, Itaru: *See*—
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Shih, David H., to Merck & Co., Inc. Process for preparing 6- and 2-substituted-1-carbadethiapen-2-em-3-carboxylic acids. 4,203,902, Cl. 260-326.310.
Shimaguchi, Takashi: *See*—
Nakae, Hideo; Ozaki, Toshinori; Nakane, Kazunori; and Shimaguchi, Takashi, 4,203,195, Cl. 29-505.000.
Shimer, Robert M.; Dombrowski, Joseph A.; and Cohen, Sheppard, to GTE Sylvania Incorporated. Integral fluorescent lamp-ballast unit. 4,204,139, Cl. 315-58.000.
Shimizu, Hirozumi: *See*—
Ishizaki, Takaharu; Igarashi, Taizo; and Shimizu, Hirozumi, 4,203,729, Cl. 44-51.000.
Shimizu, Katsuichi: *See*—
Kishi, Hirotoshi; Hattori, Hiroyuki; and Shimizu, Katsuichi, 4,203,587, Cl. 271-293.000.
Shimizu, Koh; Uchimura, Terumi; Uede, Ken-Ichi; and Nakamura, Katuyoshi, to Kubota Tekko Kabushiki Kaisha. Process for the treatment of sludge. 4,203,838, Cl. 210-63.00R.
Shimizu, Norio; Odawara, Youji; Yamaguchi, Tetsuo; Saitou, Setsuo; Nakaoka, Azuma; and Ichihashi, Kazuaki, to Hitachi, Ltd. Apparatus for high-efficient microbiological oxidation treatment. 4,203,841, Cl. 210-205.000.
Shin-Etsu Chemical Co. Ltd.: *See*—
Takamizawa, Minoru; Abe, Akira; Ono, Yoshiaki; Sugimori, Yutaka; Kishibayashi, Tetsuo; and Ino, Makoto, 4,204,030, Cl. 428-447.000.
Shindo, Yoshio; and Ito, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic transmission with overdrive. 4,203,331, Cl. 74-606.00R.
Shinshu Seiki Kabushiki Kaisha: *See*—
Usui, Kiyofumi; Otsuki, Chihiro; and Inukai, Sadaharu, 4,204,180, Cl. 335-205.000.
Shionogi & Co., Ltd.: *See*—
Narisada, Masayuki; Matsumura, Hiromu; and Nagata, Wataru, 4,203,982, Cl. 424-246.000.
Shiu, Desmond K. Moxa burner and mount for multiple moxa burners. 4,203,438, Cl. 128-254.000.
Shlatz, Myron F.: *See*—
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Shoemaker, William E.; and Wilson, David W., to Gould Inc. Method and apparatus for comparing logic functions by acquiring signals one at a time from circuit nodes. 4,204,114, Cl. 371-25.000.
Sidorov, Oleg F.: *See*—
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Siebens, Larry N., to Amerace Corporation. Double bushing insert. 4,203,641, Cl. 339-75.00P.
Siebert, Werner: *See*—
Meckel, Joachim F.; Rohde, Wolfgang; Siebert, Werner; Wagener, Dietrich; Flockenhaus, Claus; and Galow, Manfred, 4,203,803, Cl. 201-40.000.
Siegel, Herman M.: *See*—
Malek, Jack H.; and Siegel, Herman M., 4,203,251, Cl. 46-107.000.
Siegel, Israel. Space reversible differential temperature engine. 4,203,295, Cl. 60-531.000.
Siemens Aktiengesellschaft: *See*—
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Glock, Hans; and Mayer, Herbert, 4,204,276, Cl. 365-189.000.
Heinzl, Joachim, 4,204,090, Cl. 178-30.000.
Jahrig, Siegfried; and Liebig, Reinhard, 4,204,103, Cl. 200-153.0SC.
Reichel, Hilmar; Klauke, Guenter; Herting, Karl-Heinz; and Pointner, Martin, 4,203,531, Cl. 228-1.00A.
Weyer, Reinhard, 4,204,189, Cl. 340-40.000.
Siemonsen, Hans-Peter: *See*—
Roth, Mario; Siemonsen, Hans-Peter; Schmidt, Gunther; Sonntag, Hubert; and Peters, Leo, 4,203,751, Cl. 65-106.000.

Silverstein, Joseph J., to Ore-Lube Corporation, The. Stable lubricant composition containing molybdenum disulfide and method of preparing same. 4,203,854, Cl. 252-25.000.
Silverwater, Bernard F., to Pall Corporation. Magnetic pressure indicator with deactuator for bimetallic temperature-sensitive elements. 4,203,384, Cl. 116-267.000.
Simmonds Precision Products, Inc.: *See*—
Abbey, William C., 4,203,701, Cl. 415-1.000.
Simo, Miroslav A., to New Archery Products Corp. Arrowhead. 4,203,601, Cl. 273-421.000.
Simoleit, Hartmut; and Walter, Ludwig, to Kali-Chemie Aktiengesellschaft. Process for removing SO_2 from waste gases. 4,203,953, Cl. 423-243.000.
Simon, Raphael A., to Corning Glass Works. Photochromic sheet glass process. 4,204,027, Cl. 428-428.000.
Simplex Wire and Cable Company: *See*—
Hutchins, Loren H., Jr., 4,204,129, Cl. 307-147.000.
Simpson, Charles H. Process for reducing the sulfur content of coal. 4,203,727, Cl. 44-1.0SR.
Simpson Enterprises: *See*—
Simpson, Ralph E.; and Simpson, Michael L., 4,203,416, Cl. 126-212.000.
Simpson, Michael L.: *See*—
Simpson, Ralph E.; and Simpson, Michael L., 4,203,416, Cl. 126-212.000.
Simpson, Ralph E.; and Simpson, Michael L., to Simpson Enterprises. Means for holding a cooking vessel in position on a burner grate. 4,203,416, Cl. 126-212.000.
Sims, J. Robert, Jr.; Mitchell, Willard N.; and Williamson, Charles W., to Exxon Research & Engineering Co. Process for tubular water-bath polypropylene films. 4,203,942, Cl. 264-559.000.
Sindoris, Arthur R.; Farrar, Frederick G.; and Schaubert, Daniel H., to United States of America, Army. Conformal spiral antenna. 4,204,212, Cl. 343-700.0MS.
Sinegubova, Elena V.: *See*—
Podgorny, Anatoly N.; Varshavsky, Ilya L.; Solovei, Viktor V.; and Sinegubova, Elena V., 4,203,711, Cl. 417-207.000.
Singer Company, The: *See*—
Beller, W. E., 4,203,462, Cl. 137-393.000.
Current, Wayne A., 4,203,518, Cl. 206-380.000.
Singh, Gurnam, to Honeywell Inc. Piezoresistive silicon strain sensors and pressure transducers incorporating them. 4,203,327, Cl. 73-721.000.
Sinn, Hansjorg: *See*—
Janning, Jorg; Kaminsky, Walter; Sinn, Hansjorg; and Tysarcyk, Stanislav, 4,203,804, Cl. 202-121.000.
Sjoberg, Berndt O. H.: *See*—
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,203,972, Cl. 424-114.000.
Sjostrom, Douglas D.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., 4,203,444, Cl. 128-276.000.
SKF Kugellagerfabriken GmbH: *See*—
Back, Horst, 4,203,634, Cl. 308-187.200.
Skogward, Kenneth: *See*—
Giesselmann, Hannes; and Skogward, Kenneth, 4,203,378, Cl. 112-158.00E.
Slaton, Jack H., to United States of America, Navy. Underwater signal discrimination system. 4,204,280, Cl. 367-95.000.
Slawik, Eckhard: *See*—
Gast, Uwe; Kiralfy, Dennis; Schaefer, Klaus; Slawik, Eckhard; and Wellendorf, Klaus, 4,204,223, Cl. 358-80.000.
Smaw, Jesse B., to Marcal Paper Mills, Inc. Methods and apparatus for interfolding bundles of interfolded webs. 4,203,584, Cl. 270-40.000.
SMG Suddeutsche Maschinenbau-Gesellschaft mbH: *See*—
Baltschun, Horst, 4,203,359, Cl. 100-209.000.
Smit, Helen E.; and Smit, Julie A. Decorative personal electric heating appliance. 4,204,110, Cl. 219-313.000.
Smit, Julie A.: *See*—
Smit, Helen E.; and Smit, Julie A., 4,204,110, Cl. 219-313.000.
Smith, Cecil R., Jr.: *See*—
Mikolajczak, Kenneth L.; and Smith, Cecil R., Jr., 4,203,996, Cl. 424-274.000.
Smith, D. L.: *See*—
Raley, Garland E.; Miller, C. W.; and Smith, D. L., 4,203,715, Cl. 425-131.100.
Smith, Edmund H., Jr., to Du Pont de Nemours, E. I., and Company. Scanning beam displacement compensation control system. 4,203,672, Cl. 356-431.000.
Smith, Harris W.: *See*—
Gruber, Thomas J.; and Smith, Harris W., 4,203,415, Cl. 126-110.00R.
Smith International, Inc.: *See*—
Baker, William, III; and Harris, Charles R., 4,203,496, Cl. 175-329.000.
Smith, James: *See*—
Key, Brian D.; Smith, James; and Kerigan, Shaun C., 4,204,089, Cl. 178-30.000.
Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Electrical coil, insulated by cured resinous insulation. 4,204,181, Cl. 336-96.000.
Smith, John K.: *See*—
Collins, Marcus H.; and Smith, John K., 4,203,794, Cl. 156-415.000.
Smith, William T. Expanding piston. 4,203,406, Cl. 123-197.00A.
Smorzaniuk, Adam: *See*—
Mayer, Robert W.; and Smorzaniuk, Adam, 4,203,385, Cl. 116-270.000.
Snamprogetti, S.p.A.: *See*—
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,203,866, Cl. 252-429.00C.
Snarski, Thomas R., to General Motors Corporation. Process for producing oxygen-free nitrogen atmosphere. 4,203,958, Cl. 423-351.000.
Sno-Go Inc.: *See*—
Ricci, Donald C., 4,203,423, Cl. 126-271.100.
Snowden, Esther A.: *See*—
Snowden, James E., Jr.; and Snowden, Esther A., 4,203,725, Cl. 23-230.0HC.
Snowden, James E., Jr.; and Snowden, Esther A., to Contamoil Corporation. Method and test kit for the on-site determination of the presence of contaminant material in lubricating oil. 4,203,725, Cl. 23-230.0HC.
Snyder, George F.; and Stewart, Robert M., to United States Steel Corporation. Adhesives coatings and laminates utilizing ethylene copolymers and coal-tar pitch. 4,204,022, Cl. 428-337.000.
Societa Italiana Resine S.I.R. S.p.A.: *See*—
Colombo, Paolo; and Radici, Pierino, 4,203,735, Cl. 55-26.000.
Vargiu, Silvio; Carpaneti, Edoardo; and Passalenti, Beppino, 4,203,816, Cl. 204-159.160.
Societe Anonyme DBA: *See*—
Verne, Michel, 4,204,203, Cl. 340-620.000.
Societe Anonyme S.E.T.R.I.C.: *See*—
Chelle, Rene, 4,204,042, Cl. 435-253.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Farr, David R.; and Horman, Ian, 4,204,004, Cl. 426-77.000.
Societe Europeenne de Propulsion: *See*—
Luscan, Bernard; and Reichard, Michel, 4,203,284, Cl. 60-245.000.
Societe pour l'Equipement de Vehicules: *See*—
Poirier d'Ange d'Orsay, Emmanuel H., 4,204,270, Cl. 362-71.000.
Sodip SA: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,203,844, Cl. 210-321.00B.
Soeters, Raymond A., Jr., to Eaton Corporation. Engine valve control mechanism. 4,203,397, Cl. 123-90.160.
Sokolov, Valery S.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.
Sokolovsky, Paul J. Firearm apparatus. 4,203,348, Cl. 89-148.000.
Solovei, Viktor V.: *See*—
Podgorny, Anatoly N.; Varshavsky, Ilya L.; Solovei, Viktor V.; and Sinegubova, Elena V., 4,203,711, Cl. 417-207.000.
Solvay & Cie.: *See*—
Dereppe, Michel; and Leva, Jean, 4,203,876, Cl. 260-17.40R.
Sonntag, Hubert: *See*—
Roth, Mario; Siemonsen, Hans-Peter; Schmidt, Gunther; Sonntag, Hubert; and Peters, Leo, 4,203,751, Cl. 65-106.000.
Sony Corporation: *See*—
Arii, Hiroshi; Kawada, Hirohito; Yoshida, Takashi; and Nonaka, Chiaki, 4,204,246, Cl. 361-385.000.
Matsushita, Takeshi; Mamine, Takayoshi; Hayashi, Hisao; and Nishiyama, Kazuo, 4,203,780, Cl. 148-1.500.
Nemoto, Tsuneo, 4,203,564, Cl. 242-71.800.
Sorbe, Gunter: *See*—
Ahlgrim, Michael; Mietens, Gerhard; Krieger, Wilfried; and Sorbe, Gunter, 4,203,637, Cl. 339-5.00R.
Sortex North America, Inc.: *See*—
Fraenkel, Herbert; Gough, Patrick B.; and Maughan, William S., 4,203,522, Cl. 209-558.000.
Southern Railway Company: *See*—
Miller, John R., 4,203,493, Cl. 171-16.000.
Southworth, Ronald W., to Champion International Corporation. Dryer system and method of controlling the same. 4,203,229, Cl. 34-46.000.
Spaulding, James R.: *See*—
Kingsley, Charles A.; Spaulding, James R.; and Gifford, William E., 4,203,401, Cl. 123-136.000.
Spears, Jesse W.: *See*—
Kunz, Barton H.; Shlatz, Myron F.; and Spears, Jesse W., 4,203,585, Cl. 271-4.000.
Speet, Larry A.: *See*—
VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,203,639, Cl. 339-22.00R.
Sperry Rand Corporation: *See*—
Wynn, Edward J.; and Bryant, Cal L., 4,203,695, Cl. 414-40.000.
Spiral Tubing Corporation: *See*—
Perkins, Robert W., 4,203,312, Cl. 72-299.000.
Spirec l'Echangeur Spirale Ever Clean: *See*—
Jouet, Etienne, 4,203,205, Cl. 29-727.000.
Sprague Electric Company: *See*—
McGrath, N. Christian, 4,203,194, Cl. 29-570.000.
Sprague, Robert A., to Xerox Corporation. High resolution input scanner using a two dimensional detector array. 4,204,230, Cl. 358-213.000.

Springer, Donald A.: *See*—
Rubbright, Harry A.; and Springer, Donald A., 4,203,486, Cl. 165-48.00R.
Square Two Golf Corporation: *See*—
Stuff, Alfred; and Pellizzi, Anthony, 4,203,598, Cl. 273-77.00A.
Stack, Eugene V.: *See*—
Burnett, Edward L.; and Stack, Eugene V., 4,203,938, Cl. 264-127.000.
Stackpole, Chester S.: *See*—
Rose, Robert N., 4,203,761, Cl. 75-40.000.
Stackpole Components Company: *See*—
Quigley, Thomas J., 4,204,104, Cl. 200-164.00R.
Staiger, Dieter, to International Business Machines Corporation. Pattern generation system. 4,203,543, Cl. 371-24.000.
Standard Keil Hardware Manufacturing Company, a Division of Buildex Incorporated: *See*—
Cook, Sanford L.; Molisani, Justin J.; and Dennison, Kenneth I., Jr., 4,203,622, Cl. 292-221.000.
Standard-Knapp, Inc.: *See*—
Raudat, John L., 4,203,271, Cl. 53-250.000.
Standard Oil Company (Indiana): *See*—
Bertolacini, Ralph J., 4,203,829, Cl. 208-216.00R.
Hanson, Joseph B., 4,203,730, Cl. 44-71.000.
Stapp, Paul R., to Phillips Petroleum Company. Method and a catalyst for the oxidation of a conjugated diolefin. 4,203,865, Cl. 252-429.00R.
Stapp, Paul R., to Phillips Petroleum Company. Olefin oxidation process. 4,203,927, Cl. 568-401.000.
Stark, Karl-Heinz: *See*—
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, 4,203,623, Cl. 296-178.000.
Starrett, Paul D., to Monadnock Lifetime Products, Inc. Police stick. 4,203,599, Cl. 273-84.00R.
Staschik, Guunter: *See*—
Winter, Karl; and Staschik, Guunter, 4,203,734, Cl. 55-26.000.
Stauffer Chemical Co.: *See*—
Baker, Don R.; and McClellan, Malcolm B., 4,203,998, Cl. 424-283.000.
Steckel, Thomas F., to Lubrizol Corporation, The. Phenoxide-halo carboxylic acid condensate additives for lubricants. 4,203,855, Cl. 252-42.700.
Stecklein, Gary L., to Deere & Company. Articulated joint including Belleville spring seals maintained in preselected compressed state. 4,203,684, Cl. 403-158.000.
Steel Engineering Company Limited, The: *See*—
Wallace, Trevor E., 4,203,350, Cl. 91-235.000.
Steelcase, Inc.: *See*—
VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,203,639, Cl. 339-22.00R.
Steigerwald, Franz: *See*—
Hildebrandt, Bodo; Janele, Erich; and Steigerwald, Franz, 4,203,517, Cl. 206-221.000.
Steiner, Janos: *See*—
Kraxner, Istvan; Sebok, Antal; Steiner, Janos; and Toth, Jozsef, 4,203,689, Cl. 406-123.000.
Stella, Joseph A.; and Mason, Paul B., to Polaroid Corporation. Tapered pressure pad to prevent film scratching. 4,203,655, Cl. 352-78.00R.
Stemme, Otto; Lermann, Peter; Schrooder, Rolf; and Karl, Horst, to AGFA-Gevaert, A.G. Trigger mechanism for photographic camera provided with motor-driven film-transport mechanism. 4,203,662, Cl. 354-173.000.
Stencel, Edgar L.: *See*—
Hall, David E.; and Stencel, Edgar L., 4,203,346, Cl. 85-70.000.
Stenkvist, Sven-Einar, to ASEA Aktiebolag. DC Arc furnace having starting electrode. 4,204,082, Cl. 13-9.00R.
Stepp, William J. Windmill with automatic feathering control and storm protection. 4,203,707, Cl. 416-119.000.
Stetson, Earl W., to General Electric Company. Surge voltage lightning arresters. 4,204,238, Cl. 361-125.000.
Stewart, John K.; and von Beckmann, Helmuth, to Canron Corp. Lift and line beam extension. 4,203,367, Cl. 104-7.00B.
Stewart, Robert M.: *See*—
Snyder, George F.; and Stewart, Robert M., 4,204,022, Cl. 428-337.000.
Stillings, William G. Yarn cutter. 4,203,561, Cl. 242-47.000.
Stillman, Neil W.: *See*—
Schenker, Barry A.; Sugano, Thomas T.; Stillman, Neil W.; and O'Leary, Kevin J., 4,203,822, Cl. 204-301.000.
Stoddart, Hugh F., to Union Carbide Corporation. Radionuclide body function imager. 4,204,123, Cl. 250-363.00S.
Stoeppler, Markus; and Havezov, Ivan, to Kernforschungsanlage Julich Gesellschaft mit Beschrankter Haftung. Method of and apparatus for centrifugal separation of liquid phases. 4,203,840, Cl. 210-83.000.
Stoll, Andrew J., III, to Owens-Illinois, Inc. Plastic drum assembly. 4,203,526, Cl. 220-71.000.
Stollorz, Herbert R. Support arm assembly for loading/unloading and applying a force on a flying head. 4,204,235, Cl. 360-103.000.
Stoloff, Alfred; and Williams, Anthony L., to M&T Chemicals Inc. Lubricant composition for halogen-containing polymers. 4,203,880, Cl. 260-23.0XA.
Stone & Webster Engineering Corporation: *See*—
Agnihotri, Chaitanya B., 4,203,742, Cl. 62-24.000.
Stonoga, Dorothea E.; and Flint-Smith, Virginia K., to A. Bristol Corporation. Greeting card. 4,203,516, Cl. 206-216.000.
Stormby, Nils G., to Cytologiska Centrallaboratoriet AB. Method of and apparatus for applying cover-slips to slides carrying specimens for microscopic examination. 4,203,797, Cl. 156-521.000.
Strader, Walter F. Muffler. 4,203,502, Cl. 181-238.000.
Stran Corporation: *See*—
Brazelton, Carl L., 4,203,390, Cl. 119-29.000.
Strande, Edward J., to Tektronix, Inc. Multiple circuit switch assembly. 4,204,098, Cl. 200-1.00R.
Stratoflex, Inc.: *See*—
Vyse, Gerrard N.; and Cooke, Horise M., 4,203,321, Cl. 73-168.000.
Strickland, John J., to General Electric Company. Apparatus for rapidly testing electrochemical cells. 4,204,161, Cl. 324-426.000.
Stringham, Roger S.: *See*—
United States of America, National Aeronautics and Space Administration; Toy, Madeline S.; and Stringham, Roger S., 4,203,723, Cl. 8-115.500.
Striplin, Charles D. Holder for vegetables such as broccoli. 4,203,180, Cl. 24-17.00B.
Strouse, Adler Company, The: *See*—
Winzelberg, Leo L., 4,203,449, Cl. 128-473.000.
Studt, William L.: *See*—
Douglas, George H.; Mir, Ghulam N.; Won, Chong M.; and Studt, William L., 4,203,984, Cl. 424-249.000.
Stuff, Alfred; and Pellizzi, Anthony, to Square Two Golf Corporation. Golf club. 4,203,598, Cl. 273-77.00A.
Stull, Charles V.: *See*—
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Sturm, Elmar, to Ciba-Geigy Corporation. Amidino-phosphoric acid thiol esters for combating pests. 4,203,978, Cl. 424-211.000.
Sudo, Tadamitsu: *See*—
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Suehiro, Jun-ichi, to Nippon Electric Kagoshima, Ltd. Fluorescent display device comprising a pair of anode connection groups. 4,204,209, Cl. 340-758.000.
Sugalski, Raymond K.: *See*—
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Sugano, Thomas T.: *See*—
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Suganuma, Tsuneo; Ishida, Koji; Satoh, Shin; Sugie, Mamoru; Katsuyama, Toshio; and Toda, Gyozo, to Hitachi, Ltd. Method of producing optical fiber. 4,203,743, Cl. 65-3.00A.
Sugawara, Katsuro; Nakazawa, Yukiyoshi; and Itoh, Katsuhiko, to Hitachi, Ltd. Method for monitoring thickness of epitaxial growth layer on substrate. 4,203,799, Cl. 156-601.000.
Sugie, Mamoru: *See*—
Suganuma, Tsuneo; Ishida, Koji; Satoh, Shin; Sugie, Mamoru; Katsuyama, Toshio; and Toda, Gyozo, 4,203,743, Cl. 65-3.00A.
Sugihara, Takayuki: *See*—
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Sugimori, Yutaka: *See*—
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Sugiyama, Yoshinobu: *See*—
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Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, to Hoffmann-La Roche Inc. Process for the manufacture of optically active α-hydroxycarboxylic acids. 4,204,044, Cl. 435-280.000.
Sullivan, Daniel T.: *See*—
Hitz, George E.; Kaman, Charles H.; Mudge, Craig; O'Loughlin, James F.; and Sullivan, Daniel T., 4,204,252, Cl. 364-200.000.
Sumitomo Chemical Company, Limited: *See*—
Funaki, Yuji; Oshita, Hirofumi; Tanaka, Shizuya; Yamamoto, Shigeo; and Kato, Toshiro, 4,203,995, Cl. 424-273.00R.
Sumitomo Electric Industries, Ltd.: *See*—
Kono, Teruhisa, 4,203,627, Cl. 303-6.00C.
Suzuki, Fumio, 4,204,086, Cl. 174-102.00R.
Sumitomo Light Metal Industries, Ltd.: *See*—
Terai, Shiro; Tanabe, Zenichi; and Fukui, Toshiyasu, 4,203,490, Cl. 165-134.00R.
Sumner, Maurice N., to Sea Horse Corporation, The. Under water crane. 4,203,687, Cl. 405-170.000.
Sun Chemical Corporation: *See*—
Horwitt, Laurence G.; and Mattis, Donald J., 4,204,108, Cl. 219-265.000.
Horwitt, Laurence G.; and Mattis, Donald J., 4,204,109, Cl. 219-265.000.
Sun Oil Company of Pennsylvania: *See*—
Myers, Harry K., Jr., 4,203,930, Cl. 585-22.000.
Suntech, Inc.: *See*—
Norton, Richard V., 4,203,728, Cl. 44-51.000.
Supp, Emil; Jockel, Heinz; Krumm, Hagen; and Marschner, Friedemann, to Metallgesellschaft. Process of producing methanol. 4,203,915, Cl. 260-449.500.
Suris, Leonid I.: *See*—
Ivanov, Jury N.; Artemov, Konstantin V.; Suris, Leonid I.; and Bozhenov, Jury F., 4,203,372, Cl. 410-67.000.
Sutor, Anton H.: *See*—
Hofert, Wilhelm A.; Schlussel, Peter F.; Sutor, Anton H.; and Ullrich, Georg J., 4,203,446, Cl. 128-329.00R.

Sutphin, Eldon M., Jr., to RCA Corporation. Filter which tracks changing frequency of input signal. 4,204,171, Cl. 328-167.000.
Sutton, John R. Elevating assembly for an offshore platform. 4,203,576, Cl. 254-89.00R.
Suzuki, Fumio, to Sumitomo Electric Industries, Ltd. Process for the production of highly expanded polyolefin insulated wires and cables. 4,204,086, Cl. 174-102.00R.
Suzuki, Fumiyuki; Okutu, Toshimitu; and Ohe, Keitaro, to Fuji Photo Film Co., Ltd. Process for preparing polyethylene terephthalate and its low molecular weight oligomers. 4,204,070, Cl. 560-94.000.
Suzuki, Hiroshi; Ito, Yukio; Yasumoto, Yosiro; Kinomura, Sigeru; and Nagashima, Kazuo, to Agency of Industrial Science & Technology. Anionic detergent composition containing a builder mixture comprising an imidobis-sulfate and sodium citrate or nitrilotriacetate. 4,203,873, Cl. 252-545.000.
Sveda, Michael P. Modular electronic timer. 4,204,196, Cl. 340-309.400.
Swager, Gary E., to Xerox Corporation. Electronic facet error correction for laser scanning. 4,204,233, Cl. 358-293.000.
Swiadek, Stanley F. Thermal energy storage system. 4,203,489, Cl. 165-104.00S.
Swiss Aluminium Ltd.: *See*—
Buxmann, Kurt, 4,203,580, Cl. 266-216.000.
Syntex (U.S.A.) Inc.: *See*—
Knopp, Arthur A.; Nash, John E.; and Lewis, Richard P., 4,203,221, Cl. 433-117.000.
Systron Donner Corporation: *See*—
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Syva Company: *See*—
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,203,802, Cl. 435-188.000.
Szechy, Daniel J.: *See*—
Nordstrom, Larry A.; and Szechy, Daniel J., 4,203,678, Cl. 400-320.000.
Szemerey, Zoltan: *See*—
Csizy, Tibor; Karpat, Arpad; Melis, Janos; and Szemerey, Zoltan, 4,204,184, Cl. 337-295.000.
Szmuszkovicz, Jacob, to Upjohn Company, The. N-(2-Aminocyclopentyl)-N-alkanoylanilides as CNS anti-depressants. 4,204,003, Cl. 424-324.000.
Tack, Carl E., to Transdyne, Inc. Resilient pedestal wear plate. 4,203,371, Cl. 105-225.000.
Tacke, Gerhard: *See*—
Raquet, Erwin; Tacke, Gerhard; and Heller, Wilhelm, 4,203,546, Cl. 238-1.000.
Tagashira, Yoshiaki; Takagi, Hitoshi; and Inagaki, Katsumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Waste water treatment method using activated carbon. 4,203,835, Cl. 210-33.000.
Taguchi, Tetsuya: *See*—
Uchidoi, Masanori; Tsunekawa, Tokuichi; Aizawa, Hiroshi; Taguchi, Tetsuya; Ito, Tadashi; and Takishima, Yoshiyuki, 4,203,660, Cl. 354-31.000.
Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for catalytic vapor phase oxidation. 4,203,906, Cl. 260-346.400.
Takagi, Hitoshi: *See*—
Tagashira, Yoshiaki; Takagi, Hitoshi; and Inagaki, Katsumi, 4,203,835, Cl. 210-33.000.
Takahashi, Hiroyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Damper assembly of pianos. 4,203,341, Cl. 84-255.000.
Takahashi, Koji; Akimoto, Taizo; and Watanabe, Shigeru, to Fuji Photo Film Co., Ltd. Method of detecting flesh color in color originals. 4,203,671, Cl. 356-402.000.
Takahashi, Nagashige. Device for controlling curvature of an end section in an endoscope. 4,203,430, Cl. 128-4.000.
Takahashi, Ryohei: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Shigehara, Itaru; and Sakashita, Nobuyuki, 4,203,758, Cl. 71-100.000.
Takamatsu, Hideo: *See*—
Minatono, Shobu; Takamatsu, Hideo; Yamauchi, Junnosuke; and Terao, Katsuyoshi, 4,204,046, Cl. 525-65.000.
Takamizawa, Minoru; Abe, Akira; Ono, Yoshiaki; Sugimori, Yutaka; Kishibayashi, Tetsuo; and Ino, Makoto, to Shin-Etsu Chemical Co. Ltd.; and Yoshino Gypsum Co. Ltd. Organopolysiloxane sized paperboards for gypsum wallboards. 4,204,030, Cl. 428-447.000.
Takasaki, Yoshitaka; Kita, Yasuhiro; Nakagawa, Junichi; and Ishizuka, Kohei, to Hitachi, Ltd. Variable equalizer. 4,204,176, Cl. 333-28.00R.
Takasu, Hitoyuki: *See*—
Yamaguchi, Yoshinobu; and Takasu, Hitoyuki, 4,203,408, Cl. 123-198.0DC.
Takeda Chemical Industries, Ltd.: *See*—
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Takemura, Kazutoshi; Oda, Takashi; and Kiyota, Fumio, to Riken Corporation. Iron-base sintered alloy for valve seat and its manufacture. 4,204,031, Cl. 428-539.500.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,204,038, Cl. 435-78.000.
Takishima, Yoshiyuki: *See*—
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Tanabe, Naoto; Okada, Kenzoh; and Maeda, Norio, to Kurashiki Boseki Kabushiki Kaisha. Method of driving powdery material into porous material of open-celled structure. 4,204,011, Cl. 427-57.000.
Tanabe, Zenichi: *See*—
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Tanaka, Eizi; Nishimatsu, Akira; and Ohashi, Michiniro, to Nippon Soken, Inc. Supercharged internal combustion engine. 4,203,296, Cl. 60-602.000.
Tanaka, Hiroshi; and Sakurai, Kenji, to NGK Spark Plug Co., Ltd. Ceramic cutting tip. 4,203,690, Cl. 407-119.000.
Tanaka, Hiroshi; and Yamamoto, Yoshihiro, to NGK Spark Plug Co., Ltd. Aluminum nitride sintered body coated with alumina. 4,203,733, Cl. 51-295.000.
Tanaka, Kyoji: *See*—
Enomoto, Takamitsu; Tanaka, Kyoji; Kawamoto, Hiromi; Mizuno, Tamotsu; and Fujinaga, Masao, 4,203,955, Cl. 423-308.000.
Tanaka, Osamu: *See*—
Kuroki, Katsuro; and Tanaka, Osamu, 4,203,784, Cl. 148-111.000.
Tanaka, Shizuya: *See*—
Funaki, Yuji; Oshita, Hirofumi; Tanaka, Shizuya; Yamamoto, Shigeo; and Kato, Toshiro, 4,203,995, Cl. 424-273.00R.
Tanaka, Takashi: *See*—
Ii, Tadao; Tanaka, Takashi; and Akaba, Hayao, 4,203,666, Cl. 356-124.000.
Taniguchi, Hideaki: *See*—
Ochiai, Hiroyoshi; and Nakamoto, Masao, 4,203,215, Cl. 30-383.000.
Tanrikut, Yasar: *See*—
Scheffler, Glenn W.; and Tanrikut, Yasar, 4,203,963, Cl. 423-650.000.
Tansi, Hakki M., to Eagle Electric Mfg. Co., Inc. Electrical receptacle and grounding strip therefor. 4,203,638, Cl. 339-14.00P.
Tapdrup, Erik P., to Interlego A.G. Toy figure with channeled leg members. 4,203,248, Cl. 46-22.000.
Tarabaev, Gennady I.: *See*—
Krylov, Nikolai I.; Toder, Ilya A.; Sidorov, Oleg F.; Tarabaev, Gennady I.; and Pinsky, Gennady I., 4,203,310, Cl. 72-247.000.
Tasco, Inc.: *See*—
Davies, David L., 4,203,261, Cl. 51-141.000.
Tashiro, Norio: *See*—
Koinuma, Tokuju; and Tashiro, Norio, 4,204,138, Cl. 315-39.510.
Tate Architectural Products, Inc.: *See*—
Gladden, Robert S., Jr.; Johnson, Richard J.; Karmazyn, Michael J.; and Tate, Donald L., 4,203,268, Cl. 52-630.000.
Tate, Donald L.: *See*—
Gladden, Robert S., Jr.; Johnson, Richard J.; Karmazyn, Michael J.; and Tate, Donald L., 4,203,268, Cl. 52-630.000.
Tausendfreundt, Jay; and Gentile, Albert, to Imperial Knife Associated Companies, Inc. Biased pocket knife scissors. 4,203,208, Cl. 30-155.000.
Tawfik, Sobhy. Gem dichlorocyclopropanes and method of making same. 4,203,929, Cl. 260-648.00D.
Taylor, David L., to Harris Corporation. Unisolated EAROM memory array. 4,204,275, Cl. 365-163.000.
Taylor Lock Company: *See*—
Schwartz, Jerome; and Levitt, Joseph, 4,203,693, Cl. 409-81.000.
Taylor, Rueben E.: *See*—
United States of America, National Aeronautics and Space Administration; Dill, W. Preston; Taylor, Rueben E.; and Jeffers, Eldon L., 4,204,037, Cl. 435-3.000.
Technicon Instruments Corporation: *See*—
Keyes, Melvin H., 4,204,040, Cl. 435-176.000.
Roy, Ram B., 4,203,921, Cl. 260-553.00A.
Technoresinas Espanola, S.A.: *See*—
Lopez, Manuel A., 4,203,329, Cl. 74-89.200.
Tecumseh Products Company: *See*—
Farr, James B., 4,203,710, Cl. 417-53.000.
Schultz, Curtis L.; and Guntly, Thomas G., 4,203,405, Cl. 123-187.50R.
Tektronix, Inc.: *See*—
Strande, Edward J., 4,204,098, Cl. 200-1.00R.
Teletype Corporation: *See*—
Janiszewski, Stephen, 4,204,088, Cl. 178-22.000.
Telling, Ronald C.; Passingham, Roy J.; Kitchener, Brian L.; and Hopkinson, David G., to Burroughs Wellcome Co. Cell and virus culture systems. 4,203,801, Cl. 435-284.000.
Temple, Lowell D.; and Williams, Richard L. Method for connecting sewer pipes to manholes. 4,203,190, Cl. 29-451.000.
Temple, Ralph E.; and Gooding, William T., Jr., to Diamond Shamrock Corporation. Lightweight silicate aggregate. 4,203,773, Cl. 106-40.00R.
Teppo, Edward A.: *See*—
Pierce, Russell W.; Teppo, Edward A.; and Leet, Henry P., 4,203,667, Cl. 356-152.000.
Terai, Shiro; Tanabe, Zenichi; and Fukui, Toshiyasu, to Sumitomo Light Metal Industries, Ltd.; and Nippondenso Co., Ltd. Heat exchanger core having fin members serving as sacrificial anodes. 4,203,490, Cl. 165-134.00R.
Teraji, Tsutomu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,203,897, Cl. 260-239.10C.
Terao, Katsuyoshi: *See*—
Minatono, Shobu; Takamatsu, Hideo; Yamauchi, Junnosuke; and Terao, Katsuyoshi, 4,204,046, Cl. 525-65.000.

Terentiev, Viktor I.: *See—*
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

Terrapin International Limited: *See—*
Bolt, John A., 4,203,171, Cl. 4-146.000.

Terry, Malvin D., to Advanced Semiconductor Materials/America. Automatic four-point probe. 4,204,155, Cl. 324-158.00F.

Tetra Pak International AB: *See—*
Larsson, Tore I., 4,203,796, Cl. 156-504.000.

Texaco Development Corp.: *See—*
Gipson, Robert M., 4,203,910, Cl. 260-348.290.

Texaco Inc.: *See—*
Allen, Joseph C., 4,203,853, Cl. 252-8.55D.
Canup, Robert E., 4,203,404, Cl. 123-148.0ND.
Parrack, Alvin L.; and Lunsford, Delbert R., 4,204,279, Cl. 367-40.000.

Textron, Inc.: *See—*
Hangauer, David G., Jr., 4,203,883, Cl. 260-29.2TN.
Thompson, Richard T.; and Matt, Richard J., 4,203,509, Cl. 193-37.000.

Theeuwes, Felix, to Alza Corporation. Osmotic system with volume amplifier for increasing amount of agent delivered therefrom. 4,203,439, Cl. 128-260.000.

Theeuwes, Felix, to Alza Corporation. Device having variable volume chamber for dispensing useful agent. 4,203,440, Cl. 128-260.000.

Theeuwes, Felix, to Alza Corporation. Osmotically triggered device with gas generating means. 4,203,441, Cl. 128-260.000.

Thenon, Christian, to De Visu International. Rollable chart. 4,203,234, Cl. 35-76.000.

Thien, Gerhard: *See—*
Fachbach, Heinz; Thien, Gerhard; and Kirchweger, Karl, 4,203,407, Cl. 123-198.00E.
Fachbach, Heinz; Thien, Gerhard; and Meurer, Peter C., 4,203,409, Cl. 123-198.00E.

Thimsen, Mark J.: *See—*
Ivers, Robert P.; and Thimsen, Mark J., 4,203,265, Cl. 52-81.000.

Thiokol Corporation: *See—*
Kirchoff, George F.; and Schneiter, Fred E., 4,203,787, Cl. 149-35.000.

Thompson, James E. Baseball fielders signaling apparatus. 4,203,595, Cl. 273-25.000.

Thompson, Larry F., to Bell Telephone Laboratories, Incorporated. Method for the fabrication of devices including polymeric materials. 4,203,792, Cl. 156-272.000.

Thompson, Richard T.; and Matt, Richard J., to Textron, Inc. Cargo roller. 4,203,509, Cl. 193-37.000.

Thomson-CSF: *See—*
Ben Sadou, Jean-Claude; and Deman, Pierre, 4,204,172, Cl. 330-134.000.
Heuze, Philippe, 4,204,229, Cl. 358-169.000.
Velasco, Gonzalo; and Papuchon, Michel, 4,203,649, Cl. 350-96.140.

Thorn Electrical Industries Limited: *See—*
Roy, Ashutosh, 4,204,137, Cl. 313-491.000.

Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, to Laporte Industries Limited. Inorganic compounds. 4,203,861, Cl. 252-182.100.

Thorssell, Olof L., to Bulten-Kanthal AB. Flowmetering method and device. 4,203,323, Cl. 73-194.00E.

Timex Corporation: *See—*
Hsu, Ying-Yen, 4,203,862, Cl. 252-299.000.

Timken Company, The: *See—*
Reiter, Gerhard, 4,203,635, Cl. 308-213.000.

Toda, Gyozo: *See—*
Suganuma, Tsuneo; Ishida, Koji; Satoh, Shin; Sugie, Mamoru; Katsuyama, Toshio; and Toda, Gyozo, 4,203,743, Cl. 65-3.00A.

Toder, Ilya A.: *See—*
Krylov, Nikolai I.; Toder, Ilya A.; Sidorov, Oleg F.; Tarabaev, Gennady I.; and Pinsky, Gennady I., 4,203,310, Cl. 72-247.000.

Tokico, Ltd: *See—*
Saito, Yoshio; Shibata, Yoshio; and Fujiie, Satosi, 4,203,478, Cl. 141-206.000.

Tokuda, Hiromi: *See—*
Nakamura, Shigefumi; Tokuda, Hiromi; and Nohira, Hidetaka, 4,203,399, Cl. 123-119.00A.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Ichise, Wataru; Kinjo, Yasuo; Enokida, Kenji; and Nihei, Hideharu, 4,203,860, Cl. 252-181.200.
Kinoshita, Hiroyuki, 4,204,277, Cl. 365-203.000.
Koinuma, Tokuju; and Tashiro, Norio, 4,204,138, Cl. 315-39.510.

Toledo Stamping & Manufacturing Company: *See—*
Scheppele, Lyle W., 4,203,513, Cl. 198-620.000.

Tolman, Richard L.: *See—*
Fisher, Michael H.; and Tolman, Richard L., 4,203,976, Cl. 424-180.000.

Toma, Hitoshi: *See—*
Tosaka, Umi; Kondo, Hideyo; Murai, Keiichi; and Toma, Hitoshi, 4,203,764, Cl. 430-67.000.

Tomita, Takao; Anno, Nobuo; and Yamamoto, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Shock absorber. 4,203,507, Cl. 188-317.000.

Tomko, Frederick: *See—*
Zemek, Albert W.; Tomko, Frederick; Matson, Crawford; and Darrow, Burr, 4,203,583, Cl. 269-234.000.

Tomy Kogyo Co., Inc.: *See—*
Konta, Yukio, 4,203,603, Cl. 273-129.00W.

Torassa, Gerard: *See—*
Torassa, Jean F.; and Torassa, Gerard, 4,203,529, Cl. 220-337.000.

Torassa, Jean F.; and Torassa, Gerard. Pouring receptacle with automatic closure. 4,203,529, Cl. 220-337.000.

Torelli, Vesperto: *See—*
Pierdet, Andre; Torelli, Vesperto; and Deraedt, Roger, 4,203,981, Cl. 424-243.000.

Tosaka, Umi; Kondo, Hideyo; Murai, Keiichi; and Toma, Hitoshi, to Canon Kabushiki Kaisha. Polyester or polyurethane coated electrostatic image holding member. 4,203,764, Cl. 430-67.000.

Toth Aluminum Corporation: *See—*
Lippman, Alfred, 4,203,962, Cl. 423-625.000.

Toth, Jozsef: *See—*
Kraxner, Istvan; Sebok, Antal; Steiner, Janos; and Toth, Jozsef, 4,203,689, Cl. 406-123.000.

Toy, Madeline S.: *See—*
United States of America, National Aeronautics and Space Administration; Toy, Madeline S.; and Stringham, Roger S., 4,203,723, Cl. 8-115.500.

Toyoda Koki Kabushiki Kaisha: *See—*
Nishimura, Hideo; Noda, Shigeo; and Eto, Kunihiko, 4,203,691, Cl. 408-8.000.

Toyomi, Yuritugu: *See—*
Abura, Yoshinori; Toyomi, Yuritugu; and Nishino, Motohisa, 4,203,431, Cl. 128-39.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakamura, Shigefumi; Tokuda, Hiromi; and Nohira, Hidetaka, 4,203,399, Cl. 123-119.00A.
Ohta, Takaaki; and Ito, Sadayoshi, 4,203,628, Cl. 303-6.00C.
Shindo, Yoshio; and Ito, Hiroshi, 4,203,331, Cl. 74-606.00R.

Toyota Shatai Kabushiki Kaisha: *See—*
Miyata, Koji, 4,203,499, Cl. 180-89.120.

Tracy, James L., to Foster Wheeler Energy Corporation. Register. 4,203,718, Cl. 431-188.000.

Traintronics, Inc.: *See—*
Beyl, Earl L., Jr., 4,204,200, Cl. 340-384.00E.

Transdyne, Inc.: *See—*
Tack, Carl E., 4,203,371, Cl. 105-225.000.

Tremix AB: *See—*
Wenander, Harald S., 4,203,714, Cl. 425-85.000.

Trend Communications Limited: *See—*
Duerr, Jonathan H.; and Twitchen, Antony C., 4,203,679, Cl. 400-320.000.

Triumph Werke Nurnberg A.G.: *See—*
Decker, Herbert, 4,203,304, Cl. 64-13.000.

Tromp, Gerardus M. Device to apply a paper sheet to a closet seat. 4,203,530, Cl. 221-186.000.

TRW Inc.: *See—*
Jones, Robert J.; O'Rell, Michael K.; and Hom, Jim M., 4,203,922, Cl. 260-570.00R.

Tsunekawa, Tokuichi: *See—*
Uchidoi, Masanori; Tsunekawa, Tokuichi; Aizawa, Hiroshi; Taguchi, Tetsuya; Ito, Tadashi; and Takishima, Yoshiyuki, 4,203,660, Cl. 354-31.000.

Tsutsui, Hiroshi: *See—*
Yasuno, Yoshitake; Watari, Masafumi; Tsutsui, Hiroshi; Ikedo, Masaru; and Yamamoto, Osamu, 4,204,119, Cl. 250-337.000.

Turner, Charles R.: *See—*
Gill, Harnek S.; and Turner, Charles R., 4,203,301, Cl. 62-131.000.

Twitchen, Antony C.: *See—*
Duerr, Jonathan H.; and Twitchen, Antony C., 4,203,679, Cl. 400-320.000.

Typoligics, Inc.: *See—*
Ready, Patrick J., 4,204,165, Cl. 455-226.000.

Tysarcyk, Stanislav: *See—*
Janning, Jorg; Kaminsky, Walter; Sinn, Hansjorg; and Tysarcyk, Stanislav, 4,203,804, Cl. 202-121.000.

Uchida, Tomoaki, to Victor Company of Japan, Limited. Noise cancellation circuit. 4,204,219, Cl. 358-155.000.

Uchidoi, Masanori; Tsunekawa, Tokuichi; Aizawa, Hiroshi; Taguchi, Tetsuya; Ito, Tadashi; and Takishima, Yoshiyuki, to Canon Kabushiki Kaisha. Automatic exposure control system for single reflex camera. 4,203,660, Cl. 354-31.000.

Uchimura, Terumi: *See—*
Shimizu, Koh; Uchimura, Terumi; Uede, Ken-Ichi; and Nakamura, Katuyoshi, 4,203,838, Cl. 210-63.00R.

Uede, Ken-Ichi: *See—*
Shimizu, Koh; Uchimura, Terumi; Uede, Ken-Ichi; and Nakamura, Katuyoshi, 4,203,838, Cl. 210-63.00R.

Uehara, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Single or plural variable displacement pump control with an improved flow metering valve. 4,203,712, Cl. 417-218.000.

Uhara, Hiroyuki: *See—*
Takada, Masahiro; Uhara, Hiroyuki; and Sato, Takahisa, 4,203,906, Cl. 260-346.400.

Uhing, Joachim. Device for moving objects along a predetermined path. 4,203,511, Cl. 198-458.000.

Ullman, Edwin F.: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,203,802, Cl. 435-188.000.

Ullrich, Georg J.: *See*—
Hofert, Wilhelm A.; Schlussel, Peter F.; Sutor, Anton H.; and Ullrich, Georg J., 4,203,446, Cl. 128-329.00R.

Ulmer, Harry E.: *See*—
Yeh, Chuen Y.; and Ulmer, Harry E., 4,203,923, Cl. 260-586.00P.

Umen, Michael J., to McNeilab, Inc. (Piperidino oxoethoxy)acetic acid compounds, compositions and methods. 4,203,991, Cl. 424-267.000.

Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for preparing antibiotics MA 144-M_1 and MA 144-M_2. 4,204,038, Cl. 435-78.000.

Underwood, James L.; and Shapiro, Sol, to Adjusta-Mounts, Inc. Adjustable self-inking stamping device. 4,203,362, Cl. 101-327.000.

Unibra Societe Anonyme: *See*—
Delmon, Bernard M.; Portenart, Michel C.; and Viehe, Heinz, 4,203,917, Cl. 260-465.00B.

Unigate Limited Co.: *See*—
McKellen, Patrick E., 4,204,032, Cl. 429-13.000.

Union Carbide Corporation: *See*—
Nunciato, David J.; White, Norman H.; and Woodburn, William A., 4,203,778, Cl. 134-7.000.
Pelton, John F., 4,203,581, Cl. 266-217.000.
Stoddart, Hugh F., 4,204,123, Cl. 250-363.00S.

Union Connector Co., Inc.: *See*—
Wolpert, Richard W.; Wolpert, Alan T.; Bender, John F.; and McCormick, Harold, 4,203,644, Cl. 339-128.000.

Union Oil Company of California: *See*—
Watanabe, David J., 4,203,492, Cl. 166-300.000.

Unisearch Limited: *See*—
Nysen, Paul A., 4,204,260, Cl. 364-554.000.

United Aircraft Products, Inc.: *See*—
Lord, Thomas J., 4,203,566, Cl. 244-57.000.

United States of America
Agriculture: *See*—
Frank, Arlen W., 4,204,072, Cl. 560-158.000.
Friedman, Mendel, 4,203,892, Cl. 260-112.00R.
Mikolajczak, Kenneth L.; and Smith, Cecil R., Jr., 4,203,996, Cl. 424-274.000.
Saunders, Robert M.; and Kohler, George O., 4,204,008, Cl. 426-583.000.
Schultz, William G., 4,204,043, Cl. 435-267.000.
Wolter, Karl E.; Peters, William J.; Roberts, Donald R.; McReynolds, Robert D.; Broomfield, Junior; and Crews, Ernest R., 4,203,253, Cl. 47-10.000.
Air Force: *See*—
Barrett, Alfred J.; and Warner, Samuel M., 4,203,458, Cl. 137-38.000.
Ellis, Herbert B., 4,203,654, Cl. 350-285.000.
Hanloser, Kurt J.; Bruchez, Raymond J.; and Gill, James T., Jr., 4,203,285, Cl. 60-261.000.
Hose, Eddy, 4,204,210, Cl. 343-6.00R.
Minard, James V.; Goldman, Loeb J.; and Foss, Dale R., 4,203,642, Cl. 339-75.0MP.
Warburton, Robert E., 4,203,286, Cl. 60-266.000.
America: *See*—
Buchanan, Thomas M., 4,203,971, Cl. 424-92.000.
Army: *See*—
Brown, Harry A., Jr.; and Durgin, Robert F., 4,203,974, Cl. 424-166.000.
Filipov, Andree N.; Johnson, Richard N.; and Winslow, Christopher N., 4,204,198, Cl. 340-347.0AD.
Sindoris, Arthur R.; Farrar, Frederick G.; and Schaubert, Daniel H., 4,204,212, Cl. 343-700.0MS.
Commerce: *See*—
Hart, Robert L.; Paul, Frank W.; and Sauer, Wolfgang J., 4,203,582, Cl. 269-32.000.
Energy: *See*—
Miller, Donald M., 4,203,303, Cl. 64-12.000.
Interior: *See*—
Bice, Charles D.; Cooper, John H.; and Fenger, Michael L., 4,203,640, Cl. 339-41.000.
Hawkes, Ivor, 4,203,192, Cl. 29-452.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Dill, W. Preston; Taylor, Rueben E.; and Jeffers, Eldon L. Method and automated apparatus for detecting coliform organisms. 4,204,037, Cl. 435-3.000.
Rosier, William R.; and Volk, George G. Portable device for use in starting air-start units for aircraft and having cable lead testing capability. 4,204,154, Cl. 324-51.000.
Toy, Madeline S.; and Stringham, Roger S. Vitra-violet process for producing flame resistant polyamides and products produced thereby. 4,203,723, Cl. 8-115.500.
Navy: *See*—
Burnham, Bradshaw; and Nichols, Charles F., 4,203,365, Cl. 102-214.000.
Coleman, Randolph D., 4,204,143, Cl. 318-341.000.
Pierce, Russell W.; Teppo, Edward A.; and Leet, Henry P., 4,203,667, Cl. 356-152.000.
Slaton, Jack H., 4,204,280, Cl. 367-95.000.
Wilkes, Gilbert, 4,203,366, Cl. 102-214.000.

U.S. Philips Corporation: *See*—
de Jager, Frank, 4,204,163, Cl. 375-25.000.
Eggermont, Ludwig D. J., 4,204,177, Cl. 333-166.000.
Kowalski, Gunter, 4,204,124, Cl. 250-445.00T.
Mitchell, Richard F., 4,204,178, Cl. 333-194.000.
Ricouard, Jean-Pierre; and Schorter, Bruno, 4,204,158, Cl. 324-208.000.
van den Hanenberg, Joannes G.; and de Munnik, Frederikus J., 4,204,253, Cl. 364-200.000.

United States Steel Corporation: *See*—
Snyder, George F.; and Stewart, Robert M., 4,204,022, Cl. 428-337.000.

United Technologies Corporation: *See*—
Grantham, Daniel H., 4,203,813, Cl. 204-103.000.
Grantham, Daniel H., 4,203,814, Cl. 204-129.000.
Hess, W. Graig, 4,203,706, Cl. 416-97.00A.
Lipman, Kenneth, 4,204,264, Cl. 363-71.000.
Rybicki, Robert C., 4,203,708, Cl. 416-134.00A.
Scheffler, Glenn W.; and Tanrikut, Yasar, 4,203,963, Cl. 423-650.000.
Sederquist, Richard A., 4,203,950, Cl. 422-197.000.
Vivirito, Joseph R., 4,204,268, Cl. 363-135.000.
Wesbecher, James J., 4,203,705, Cl. 416-95.000.

Universal Instruments Corporation: *See*—
Zemek, Albert W.; Tomko, Frederick; Matson, Crawford; and Darrow, Burr, 4,203,583, Cl. 269-234.000.

University Patents, Inc.: *See*—
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Gau, Shek-Chung, 4,204,216, Cl. 357-8.000.

Unsold, Eberhard: *See*—
Aberle, Lothar; Bank, Walter; Hillenkamp, Franz; Kaufmann, Raimund; Nitsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,204,117, Cl. 250-287.000.

UOP Inc.: *See*—
Frame, Robert R., 4,203,827, Cl. 208-206.000.
Imai, Tamotsu; and Homeier, Edwin H., 4,204,066, Cl. 546-348.000.

Upjohn Company, The: *See*—
Evans, Timothy W., 4,203,903, Cl. 260-340.300.
Kelly, Robert C., 4,204,057, Cl. 542-426.000.
Nelson, Norman A., 4,203,924, Cl. 568-379.000.
Nelson, Norman A., 4,204,079, Cl. 568-838.000.
Szmuszkovicz, Jacob, 4,204,003, Cl. 424-324.000.

USM Corporation: *See*—
Rawson, Francis F. H., 4,203,189, Cl. 29-432.000.

Usui, Kiyofumi; Otsuki, Chihiro; and Inukai, Sadaharu, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. End of paper roll detection assembly. 4,204,180, Cl. 335-205.000.

Valeron Corporation, The: *See*—
Ruszala, Frederick B.; and Cook, Kenneth J., 4,204,261, Cl. 364-607.000.

Vance, Fred L., Jr.: *See*—
Bressler, Wilbur L.; Lowery, Kirby, Jr.; and Vance, Fred L., Jr., 4,204,050, Cl. 526-97.000.

van den Hanenberg, Joannes G.; and de Munnik, Frederikus J., to U.S. Philips Corporation. Device for generating and correcting a user program. 4,204,253, Cl. 364-200.000.

VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., to Steelcase, Inc. Panel wiring system. 4,203,639, Cl. 339-22.00R.

van der Harst, Pieter A., to Hoogovens IJmuiden, B.V. Railway level crossing. 4,203,547, Cl. 238-8.000.

van der Sanden, Ludovicus C.: *See*—
Gilissen, Hermanus P. J.; van Dijk, Petrus R. M.; and van der Sanden, Ludovicus C., 4,203,203, Cl. 29-846.000.

van Dijk, Petrus R. M.: *See*—
Gilissen, Hermanus P. J.; van Dijk, Petrus R. M.; and van der Sanden, Ludovicus C., 4,203,203, Cl. 29-846.000.

Vandlik, Robert P.; and Herdzina, Frank J., to American Can Company. Positive transfer means between two independently driven mechanical presses. 4,203,314, Cl. 72-427.000.

van Heek, Karl-Heinrich: *See*—
Wagener, Heinrich; and van Heek, Karl-Heinrich, 4,203,833, Cl. 209-139.00R.

Van Note, Richard. Dissecting board and process for dissecting a specimen. 4,203,231, Cl. 35-20.000.

Van Over, William E.: *See*—
Brown, Alvin E.; and Van Over, William E., 4,203,322, Cl. 73-194.00A.

Van Pelt, R. Harrison, Jr. Ski training device. 4,203,235, Cl. 36-118.000.

van Westenbrugge, Johan K.: *See*—
Beyer, Nico H. H.; Huigen, Johannes H.; and van Westenbrugge, Johan K., 4,203,185, Cl. 29-157.30C.

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Varga, Janos: *See*—
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Vargiu, Silvio; Carpaneti, Edoardo; and Passalenti, Beppino, to Societa Italiana Resine S.I.R. S.p.A. Compositions hardenable by UV radiation comprising an unsaturated epoxy resin ester and an unsaturated monomer. 4,203,816, Cl. 204-159.160.

Varian Associates, Inc.: *See*—
Patterson, Paul L., 4,203,726, Cl. 23-232.00E.

Varshavsky, Ilya L.: *See*—
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Vaseen, V. A., to Vaseen, Vesper Albert. Oxygen production by paramagnetic removal of magnetized oxygen from liquid air. 4,203,740, Cl. 62-18.000.

Vaseen, Vesper Albert: *See*—
Vaseen, V. A., 4,203,740, Cl. 62-18.000.

Vasilevsky, Petr N.; Ediny, Jury G.; and Parfinenko, Ivan V. Method of removing concretions from the ureter. 4,203,429, Cl. 128-1.00R.
Vaussanvin, Marcel, to Manufacture Metallurgique de Tournus. Oscillating cooking apparatus. 4,203,357, Cl. 99-340.000.
Velasco, Gonzalo; and Papuchon, Michel, to Thomson-CSF. Process for manufacturing an integrated optical structure and an opto-electronic device using said structure. 4,203,649, Cl. 350-96.140.
Vermeer, Gary J. Tractor mounted harvester unit. 4,203,275, Cl. 56-15.800.
Verne, Michel, to Societe Anonyme DBA. Level indicator. 4,204,203, Cl. 340-620.000.
Vertesy, Laszlo; and Huber, Gerhard, to Hoechst Aktiengesellschaft. Process for obtaining cephalosporin C and the salts and derivatives thereof from culture filtrates or culture solutions. 4,204,058, Cl. 544-4.000.
Victor Company of Japan, Limited: *See*—
Ishigaki, Yukinobu; and Muraoka, Teruo, 4,204,091, Cl. 179-1.0GB.
Uchida, Tomoaki, 4,204,219, Cl. 358-155.000.
Vidas, Pat. Trumpet and synthesizer apparatus capable of polyphonic operation. 4,203,338, Cl. 84-1.140.
Viehe, Heinz: *See*—
Delmon, Bernard M.; Portenart, Michel C.; and Viehe, Heinz, 4,203,917, Cl. 260-465.00B.
Vieille-Mecet, Jean-Pierre J. Y. Additional carburetor. 4,203,411, Cl. 123-127.000.
Vieu, Alain; and Flambard, Christian, to Framatome; and Centre Technique des Industries Mechaniques. Reference part, especially for nondestructive testing by ultrasonic vibrations, and a method for the fabrication of said part. 4,203,315, Cl. 73-1.00R.
Villamos Berendezes es Keszuvek Muvek: *See*—
Csizy, Tibor; Karpat, Arpad; Melis, Janos; and Szemerey, Zoltan, 4,204,184, Cl. 337-295.000.
Vitale, Gina G.: *See*—
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Le Grand, Donald G.; and Vitale, Gina G., 4,204,026, Cl. 428-409.000.
Vitek, Randall M.: *See*—
Lautenschlager, Eugene P.; Robinson, Peter J.; and Vitek, Randall M., 4,203,223, Cl. 433-75.000.
Vitellaro, Frank A., to Dayco Corporation. Wire reinforced hose. 4,203,476, Cl. 138-122.000.
Vivirito, Joseph R., to United Technologies Corporation. Auxiliary commutation circuit for an inverter. 4,204,268, Cl. 363-135.000.
Vogt, Hans. Device for cooking foodstuffs. 4,203,358, Cl. 99-352.000.
Voith Turbo GmbH & Co., KG: *See*—
Muschelknautz, Horst, 4,203,289, Cl. 60-358.000.
Vokac, James: *See*—
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Volk, George G.: *See*—
United States of America, National Aeronautics and Space Administration; Rosier, William R.; and Volk, George G., 4,204,154, Cl. 324-51.000.
Voll, Walter. Metal detector circuit with automatic optimum sensitivity adjustment. 4,204,160, Cl. 324-236.000.
von Beckmann, Helmuth: *See*—
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Vorbruggen, Helmut: *See*—
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Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia: *See*—
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Hall, David E.; and Stencel, Edgar L., 4,203,346, Cl. 85-70.000.
Vyse, Gerrard N.; and Cooke, Horise M., to Stratoflex, Inc. Method and apparatus for testing hydraulic and pneumatic systems. 4,203,321, Cl. 73-168.000.
W. R. Grace & Co.: *See*—
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Wagener, Dietrich: *See*—
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Wagener, Heinrich; and van Heek, Karl-Heinrich, to Bergwerksverband GmbH. Conveying and classifying of particulate substances. 4,203,833, Cl. 209-139.00R.
Wallace, Charles W. Action sign. 4,203,241, Cl. 40-406.000.
Wallace, Trevor E., to Steel Engineering Company Limited, The. Hydraulic percussive machines. 4,203,350, Cl. 91-235.000.
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Rollmann, Louis D.; and Walsh, Dennis E., 4,203,830, Cl. 208-236.000.
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Parisi, Michael S.; and Pauly, John A., 4,204,186, Cl. 338-30.000.
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Wang, Patricia C.; Wingard, Robert E., Jr.; and Crosby, Guy A., to Dynapol. 4-(Dihydroxyhexoxy)dihydrochalcone sweeteners. 4,204,007, Cl. 426-548.000.
Wankel, Felix. Water foil. 4,203,381, Cl. 114-274.000.
Warburton, Robert E., to United States of America, Air Force. Cooling apparatus for an exhaust nozzle of a gas turbine engine. 4,203,286, Cl. 60-266.000.
Ward, Eldon L.: *See*—
Martin, Charles W.; and Ward, Eldon L., 4,203,999, Cl. 424-286.000.
Wardlaw, Stephen C.; and Levine, Robert A. Insulating window structure and method of forming the same. 4,204,015, Cl. 428-34.000.
Warkentin, Aaron J.; and Hiebert, Jacob, to Pennwalt Corporation. Apparatus for packing articles of fruit into boxes. 4,203,274, Cl. 53-537.000.
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Warner-Lambert Company: *See*—
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Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, 4,204,044, Cl. 435-280.000.
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Way, Lee V., Jr. Portable solar/non-solar cooker. 4,203,427, Cl. 126-451.000.
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Weichart, Helmut; and Schmidt, Jurgen, to Prakla-Seismos GmbH. Cable for sea seismic exploration. 4,204,188, Cl. 340-7.00R.
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Wella Aktiengesellschaft: *See*—
Hildebrandt, Bodo; Janele, Erich; and Steigerwald, Franz, 4,203,517, Cl. 206-221.000.
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Wellner, Wolfgang; and Gruber, Hermann, to Bayer Aktiengesellschaft. Process for polyurethanes from ortho-ester-blocked polyols. 4,204,051, Cl. 528-55.000.
Wells, Theodore W. Rockable TV mount. 4,203,636, Cl. 312-7.0TV.
Welsh, Alan B.; and Robinson, John W., to Kimball International, Inc. Brass keyer system for electronic organ. 4,203,339, Cl. 84-1.190.
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Gyugyi, Laszlo; and Brennen, Michael B., 4,204,151, Cl. 323-119.000.
Kruper, Andrew P., 4,204,128, Cl. 307-141.000.
Lin, Kou C.; and Woods, Edmund E., 4,204,087, Cl. 174-120.0SR.
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Smith, James D. B.; and Kauffman, Robert N., 4,204,181, Cl. 336-96.000.
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Westland Aircraft Limited: *See—*
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Wheeler, Myron S.; and Creasy, Stephen L., to Westinghouse Electric Corp. Flexible dipole antenna. 4,204,213, Cl. 343-706.000.
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Wiebe, Gerald L. Method and apparatus for making an encapsulated plug-in blade fuse. 4,203,200, Cl. 29-623.000.
Wieland, Clarence W. Child-proof closure device. 4,203,524, Cl. 215-216.000.
Wiener, Joseph, to Dorf, Carl. Dental model assembly and production method. 4,203,219, Cl. 433-74.000.
Wigley, Patrick A., to CPS, Inc. Heat dissipating circuit board assembly. 4,204,247, Cl. 361-387.000.
Wiley, David; and Williams, David G., to Lucas Industries Limited. Brake pad wear detection system. 4,204,190, Cl. 340-52.00A.
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Winter, Karl; and Staschik, Guunter, to Ceagfilter und Entstaubungstechnik GmbH. Method and apparatus for the selective adsorption of vaporous or gaseous impurities from other gases. 4,203,734, Cl. 55-26.000.
Winzelberg, Leo L., to Strouse, Adler Company, The. Stretchable underwire casing for breast pockets. 4,203,449, Cl. 128-473.000.
Wirtz, Peter; and Broall, Richard, to Hoechst Aktiengesellschaft. Foam extinguishing agent. 4,203,850, Cl. 252-8.050.
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Wolter, Karl E.; Peters, William J.; Roberts, Donald R.; McReynolds, Robert D.; Broomfield, Junior; and Crews, Ernest R., to United States of America, Agriculture. Process for increasing oleoresin synthesis in pinus species. 4,203,253, Cl. 47-10.000.
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Woods, Hanbury J.; Chase, John D.; and Galvez, Buenaventura B., to Gulf Canada Limited. Etherification processing of light hydrocarbons. 4,204,077, Cl. 568-697.000.
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Swager, Gary E., 4,204,233, Cl. 358-293.000.
Yabe, Ikuo, to Nikkiso Co., Ltd. Automatic apparatus for continuous determination of boron and lithium concentrations. 4,204,259, Cl. 438-497.000.

Yagi, Kenjiro; and Hirai, Hirotomo, to Kabushiki Kaisha Daini Seikosha. Electronic display device. 4,204,205, Cl. 340-719.000.

Yamada, Senichi; and Kato, Yoshio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Steel having a uni-directional lamellar martensite structure in an austenite matrix. 4,203,782, Cl. 148-12.00E.

Yamaguchi, Osamu: *See*—
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Yamaguchi, Yoshinobu; and Takasu, Hitoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Lubricating oil detector for an internal combustion engine. 4,203,408, Cl. 123-198.0DC.

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Yamashita, Kyoichi, to Koyo Jidoki Corporation Ltd. Labeling device. 4,203,798, Cl. 156-567.000.

Yamauchi, Junnosuke: *See*—
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Yang, Huan-Tong, to GTE Automatic Electric Laboratories Incorporated. Low power consumption relay switching circuit for use in conjunction with a line test trunk interfacing to a test desk. 4,204,241, Cl. 361-154.000.

Yano, Takato: *See*—
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Yasumoto, Yosiro: *See*—
Suzuki, Hiroshi; Ito, Yukio; Yasumoto, Yosiro; Kinomura, Sigeru; and Nagashima, Kazuo, 4,203,873, Cl. 252-545.000.

Yasuno, Yoshitake; Watari, Masafumi; Tsutsui, Hiroshi; Ikedo, Masaru; and Yamamoto, Osamu, to Matsushita Electric Industrial Co., Ltd. Method of reading thermoluminescent dosimeter. 4,204,119, Cl. 250-337.000.

Yeager, Marvin L.: *See*—
Desso, Jerome A.; Ritchie, Leon T.; and Yeager, Marvin L., 4,203,646, Cl. 339-205.000.

Yeh, Chuen Y.; and Ulmer, Harry E., to Allied Chemical Corporation. Method for promotion of phenol hydrogenation. 4,203,923, Cl. 260-586.00P.

Yeh, Yu Shuan, to Bell Telephone Laboratories, Incorporated. Variable frame rate technique for use in a time-division multiple access (TDMA) communication system. 4,204,093, Cl. 370-95.000.

Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; and Won, Chong M., to William H. Rorer, Inc. Spasmolytic triazinones. 4,203,983, Cl. 424-249.000.

Yelnosky, John; Douglas, George H.; Mir, Ghulam N.; Patel, Dahyabhai M.; Won, Chong M.; and Alioto, Ronald L., to William H. Rorer, Inc. Antidiarrheal triazinones. 4,203,985, Cl. 424-249.000.

Yen, Chung H.; and Deason, James R., to G. D. Searle & Co. Antidiarrheal diaryl-(1-azabicyclo(2.2.2)octan-2-yl)-alkanols and related compounds. 4,203,989, Cl. 424-267.000.

Yen, Chung H., to G. D. Searle & Co. Anti-diarrheal 2-substituted quinuclidines. 4,203,990, Cl. 424-267.000.

Yokogawa, Tomohisa: *See*—
Sato, Reisuke; and Yokogawa, Tomohisa, 4,204,169, Cl. 455-175.000.

Yokomichi, Isao: *See*—
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Shigehara, Itaru; and Sakashita, Nobuyuki, 4,203,758, Cl. 71-100.000.

Yokose, Kazuteru: *See*—
Suhara, Yasuji; Maruyama, Hiromi; Sawada, Toyoaki; Ogawa, Mayumi; Yokose, Kazuteru; Fujiu, Morio; and Watanabe, Kimihiro, 4,204,044, Cl. 435-280.000.

Yonko, Jon D., to Monsanto Company. Heating improvements in a preform reheat system. 4,204,111, Cl. 219-411.000.

Yorgiadis, Alexander. Strain gage load cell. 4,203,318, Cl. 73-141.00A.

Yorioka, Keigo, to Aisan Industry Co., Ltd. Exhaust gas recirculation system for an internal combustion engine. 4,203,400, Cl. 123-119.00A.

Yoshida Kogyo K.K.: *See*—
Hirai, Mitsuru, 4,203,514, Cl. 198-774.000.
Oyama, Yoshio, 4,203,207, Cl. 29-767.000.

Yoshida, Minoru: *See*—
Fukushima, Hiroyuki; Yoshida, Minoru; and Inoue, Hiromasa, 4,203,196, Cl. 29-566.300.

Yoshida, Takashi: *See*—
Arii, Hiroshi; Kawada, Hirohito; Yoshida, Takashi; and Nonaka, Chiaki, 4,204,246, Cl. 361-385.000.

Yoshino Gypsum Co. Ltd.: *See*—
Takamizawa, Minoru; Abe, Akira; Ono, Yoshiaki; Sugimori, Yutaka; Kishibayashi, Tetsuo; and Ino, Makoto, 4,204,030, Cl. 428-447.000.

Young, Jack H.; and Halleck, Frank E., to American Sterilizer Company. Load conditioning control apparatus for steam sterilization. 4,203,947, Cl. 422-114.000.

Youngers, Stephen A., to J. I. Case Company. Control mechanism for hydrostatic pump. 4,203,291, Cl. 60-433.000.

Zacharie, Antoine. High output LED matrix color TV screen with vertical triad and tricolor faceplate. 4,204,222, Cl. 358-59.000.

Zahnradfabrik Friedrichshafen, AG: *See*—
Burckardt, Dieter, 4,203,290, Cl. 60-420.000.
Deininger, Horst, 4,203,292, Cl. 60-445.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,204,038, Cl. 435-78.000.

Zaluska, Philip J.: *See*—
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,204,062, Cl. 544-351.000.

Zavod Stroitelnykh Mashin: *See*—
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,203,688, Cl. 406-85.000.

Zemek, Albert W.; Tomko, Frederick; Matson, Crawford; and Darrow, Burr, to Universal Instruments Corporation. Radial lead component insertion machine. 4,203,583, Cl. 269-234.000.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Preparation of trans cyclohexane 1,4 diisocyanate. 4,203,916, Cl. 260-453.00P.

Zenker, Nicolas: *See*—
Arnett, Carroll D.; Wright, Jeremy; and Zenker, Nicolas, 4,204,069, Cl. 548-325.000.

Zettler, Franz. Process and apparatus for cutting sheets into individual sheets and subsequent orderly stacking of the individual sheets. 4,203,334, Cl. 83-23.000.

Zeuthen, Karl G., to Rex-Rotary International/A.S. Toner powder supply system. 4,203,533, Cl. 222-241.000.

Ziegler, Jacques; Schneiter, Ali; and Grandjean, Remy, to Ebauches, S.A. Touch sensitive device for a timepiece. 4,203,280, Cl. 368-187.000.

Zilbermann, Andre H.; and Aronoff, Melvin S. Multizone air terminal. 4,203,485, Cl. 165-2.000.

Zimmer, Peter; Kudlich, Hans; Schweitzer, Karl; and Mayr, Walter, to Maschinenfabrik Peter Zimmer Aktiengesellschaft. Valve-needle mounting for dyestuff applicator. 4,203,554, Cl. 239-585.000.

Zingerman, Bryant N.: *See*—
Kitcher, James R.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,203,800, Cl. 156-643.000.

Zitelli, William E.; and Heltsley, Alan T., to Westinghouse Electric Corp. Turbine acceleration governing system. 4,204,258, Cl. 364-494.000.

Zocholl, Stanley E., to Gould Inc. Solid state transformer differential relay. 4,204,237, Cl. 361-36.000.

Zoecon Corporation: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,204,071, Cl. 560-100.000.

Zolor Corporation: *See*—
Hamburger, Herman, 4,203,626, Cl. 299-33.000.

Zubanov, Fedor F.: *See*—
Esaian, Levon P.; Sokolov, Valery S.; Kurygina, Dina V.; Zubanov, Fedor F.; Aleshin, Valentin N.; Bolshov, Gennady V.; Kuzyko, Igor S.; Fedotov, Oleg A.; Belysheva, Ninel K.; Anosov, Alexei M.; Antonov, Alexei I.; Terentiev, Viktor I.; Naumenko, Viktor A.; and Akimov, Boris V., 4,203,202, Cl. 29-623.200.

Zvenigorodsky, Evgeny I.: *See*—
Shapunov, Max M.; Koppel, Mikhail A.; Frumkin, Felix M.; Zvenigorodsky, Evgeny I.; and Gabor, Antal, 4,203,688, Cl. 406-85.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MAY, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMP Incorporated: *See*—
Simmons, Reginald J., Re. 30,277, Cl. 339-74.00R.

Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., to Westinghouse Electric Corp. Modular operating centers and methods of building same for use in electric power generating plants and other industrial and commercial plants, processes and systems. Re. 30,280, Cl. 290-1.00R.

Bussjager, Rudy C.: *See*—
del Toro, James J.; and Bussjager, Rudy C., Re. 30,275, Cl. 62-115.000.

Carrier Corporation: *See*—
del Toro, James J.; and Bussjager, Rudy C., Re. 30,275, Cl. 62-115.000.

Crews, Roy E.: *See*—
Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., Re. 30,280, Cl. 290-1.00R.

del Toro, James J.; and Bussjager, Rudy C., to Carrier Corporation. Heat exchanger. Re. 30,275, Cl. 62-115.000.

Du Pont de Nemours, E. I., and Company: *See*—
Rohde, Vernon C., Re. 30,276, Cl. 233-26.000.

Giras, Theodore C.: *See*—
Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., Re. 30,280, Cl. 290-1.00R.

Leonard, Robert J.: *See*—
Stumpf, Richard J.; Watson, Waldon O.; and Leonard, Robert J., Re. 30,278, Cl. 352-5.000.

MCA Systems, Inc.: *See*—
Stumpf, Richard J.; Watson, Waldon O.; and Leonard, Robert J., Re. 30,278, Cl. 352-5.000.

Rohde, Vernon C., to Du Pont de Nemours, E. I., and Company. Apparatus for stopper removal. Re. 30,276, Cl. 233-26.000.

Simmons, Reginald J., to AMP Incorporated. Electrical tab receptacle. Re. 30,277, Cl. 339-74.00R.

Stauffer Chemical Company: *See*—
Toy, Arthur D. F.; and Uhing, Eugene H., Re. 30,279, Cl. 260-543.00P.

Stumpf, Richard J.; Watson, Waldon O.; and Leonard, Robert J., to MCA Systems, Inc. Special effects generation and control system for motion pictures. Re. 30,278, Cl. 352-5.000.

Toy, Arthur D. F.; and Uhing, Eugene H., to Stauffer Chemical Company. Process for preparing alkyl or aryl phosphorus halides and mixed isomers thereof. Re. 30,279, Cl. 260-543.00P.

Uhing, Eugene H.: *See*—
Toy, Arthur D. F.; and Uhing, Eugene H., Re. 30,279, Cl. 260-543.00P.

Watson, Waldon O.: *See*—
Stumpf, Richard J.; Watson, Waldon O.; and Leonard, Robert J., Re. 30,278, Cl. 352-5.000.

Westinghouse Electric Corp.: *See*—
Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., Re. 30,280, Cl. 290-1.00R.

LIST OF PLANT PATENTEES

Fischer, Arnold W., to Pan-American Plant Company. African violet cultivar named Grace. 4,536, 5-20-80, Cl. 69.000.

Jackson & Perkins Co.: *See*—
Warriner, William A., 4,537, Cl. 11.000.

Pan-American Plant Company: *See*—
Fischer, Arnold W., 4,536, Cl. 69.000.

Warriner, William A., to Jackson & Perkins Co. Rose plant. 4,537, 5-20-80, Cl. 11.000.

LIST OF DESIGN PATENTEES

A-T-O Inc.: *See*—
Meister, Michael L.; Fee, Robert W.; and Robbins, Richard J., 255,024, Cl. D12-61.000.

Adreon, Gary L.: *See*—
Cooper, Leonard M.; and Adreon, Gary L., 255,011, Cl. D9-245.000.

Airwick Industries, Inc.: *See*—
Muller, Arthur W.; and Hassle, Max A., 255,047, Cl. D23-150.000.

Alexson, Peter C. Combined pump and filter for aquariums or the like. 255,033, 5-20-80, Cl. D15-8.000.

Almatic Industries Limited: *See*—
Matusiak, Stephen H.; and Matusiak, Gerald W., 255,009, Cl. D7-136.000.

American Guidance Service, Inc.: *See*—
Gale, John A., 255,039, Cl. D21-108.000.

Becker, Robert W.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Becker, Robert W., 255,008, Cl. D7-132.000.

Boldt, Melvin H.; Morrison, Thurber H.; and Becker, Robert W., to National Presto Industries, Inc. Cooking appliance handle. 255,008, 5-20-80, Cl. D7-132.000.

Boller, Peter K., to Consumers Glass Company Limited. Produce hamper. 255,010, 5-20-80, Cl. D9-220.000.

Braun AG: *See*—
Haase, Heinz-Ulrich, 255,052, Cl. D28-13.000.

Bridgestone Tire Company, Limited: *See*—
Takigawa, Hiroyoshi; and Miyamura, Nobuhiro, 255,025, Cl. D12-143.000.

Brown Group, Inc.: *See*—
Hanson, Robert B., 254,997, Cl. D2-322.000.

Brownlie, Alan W., to Welch Allyn, Inc. Charger unit for battery powered diagnostic instruments. 255,029, 5-20-80, Cl. D13-6.000.

Campo, Charles. Lamp. 255,055, 5-20-80, Cl. D26-104.000.

Charlton Company, The: *See*—
Thorpe, Robert K., 255,004, Cl. D6-196.000.

Cochran, Ken C.; and Fuller, Walter. Basketball practice goal. 255,040, 5-20-80, Cl. D21-201.000.

Coleman Company, Inc., The: *See*—
Hemminger, Larry L., 255,027, Cl. D12-156.000.

Collins, John, to Leer, Inc. Pick-up truck rear panel. 255,028, 5-20-80, Cl. D12-196.000.

Compagnie Generale des Etablissements Michelin: *See*—
Peron, Jean-Claude, 255,026, Cl. D12-147.000.

Consumers Glass Company Limited: *See*—
Boller, Peter K., 255,010, Cl. D9-220.000.

Cooper, Leonard M.; and Adreon, Gary L., to Olinkraft, Inc. Carton blank. 255,011, 5-20-80, Cl. D9-245.000.

Correa, Philip J. Fishing lure. 255,044, 5-20-80, Cl. D22-27.000.

Creative Playgrounds Corporation: *See*—
Dieter, Berthold B.; and Gibson, Charles L., 254,999, Cl. D6-42.000.

Daiwa Seiko, Inc.: *See*—
Iinuma, Kanji, 255,042, Cl. D22-25.000.

Dakota Cateye, Inc.: *See*—
Muehl, Lawrence L., 255,041, Cl. D22-23.000.

Dieter, Berthold B.; and Gibson, Charles L., to Creative Playgrounds Corporation. Combined chair and tray for the handicapped. 254,999, 5-20-80, Cl. D6-42.000.

Dinh Van, Jean, to S. T. Dupont. Operating assembly for a cigarette lighter. 255,046, 5-20-80, Cl. D27-36.000.

Dybal, Walter F., to Shelly & Anderson Furniture Mfg. Co., Inc. Sofa. 255,000, 5-20-80, Cl. D6-63.000.

Dynabrade, Inc.: *See—*
Welsch, Walter N.; and Fleckenstein, Elwin H., 255,034, Cl. D15-126.000.

Espeseth, Donald O., to Wilstac Inc. Portable podium. 254,998, 5-20-80, Cl. D6-27.000.

Ethyl Products Company: *See—*
Ostrowsky, Efrem M., 255,012, Cl. D09-258.000.

Fee, Robert W.: *See—*
Meister, Michael L.; Fee, Robert W.; and Robbins, Richard J., 255,024, Cl. D12-61.000.

Felix, Cristian J.: *See—*
Genaro, Donald M.; Felix, Cristian J.; Tilley, Alvin R.; and Peets, Robert S., 255,003, Cl. D6-167.000.

Fleckenstein, Elwin H.: *See—*
Welsch, Walter N.; and Fleckenstein, Elwin H., 255,034, Cl. D15-126.000.

Fuchs, Nathan, to Van Wyck International Corporation. Fruit juicer, or similar article. 255,005, 5-20-80, Cl. D7-49.000.

Fuller, Walter: *See—*
Cochran, Ken C.; and Fuller, Walter, 255,040, Cl. D21-201.000.

Gale, John A., to American Guidance Service, Inc. Toy construction piece. 255,039, 5-20-80, Cl. D21-108.000.

Genal Strap, Inc.: *See—*
Hofman, Bronislaw L., 255,016, Cl. D11-3.000.
Hofman, Bronislaw L., 255,017, Cl. D11-3.000.
Hofman, Bronislaw L., 255,018, Cl. D11-3.000.
Hofman, Bronislaw L., 255,019, Cl. D11-3.000.
Hofman, Bronislaw L., 255,020, Cl. D11-3.000.
Hofman, Bronislaw L., 255,021, Cl. D11-3.000.
Hofman, Bronislaw L., 255,022, Cl. D11-3.000.
Hofman, Bronislaw L., 255,023, Cl. D11-15.000.

Genaro, Donald M.; Felix, Cristian J.; Tilley, Alvin R.; and Peets, Robert S., to Singer Company, The. Cabinet for a sewing machine and accessory items. 255,003, 5-20-80, Cl. D6-167.000.

Gerlinger, Edward B.: *See—*
Hill, James A.; Gerlinger, Edward B.; Leith, Robert H.; and Navia, Jaime A., 255,014, Cl. D10-75.000.

Gibson, Charles L.: *See—*
Dieter, Berthold B.; and Gibson, Charles L., 254,999, Cl. D6-42.000.

Grunstad, Jerome A., to Ketcham & McDougall, Inc. Note pad holder. 255,037, 5-20-80, Cl. D19-92.000.

Haase, Heinz-Ulrich, to Braun AG. Polyfunctional hand-held hairdryer. 255,052, 5-20-80, Cl. D28-13.000.

Hanson, Robert B., to Brown Group, Inc. Shoe sole. 254,997, 5-20-80, Cl. D2-322.000.

Hassle, Max A.: *See—*
Muller, Arthur W.; and Hassle, Max A., 255,047, Cl. D23-150.000.

Hemminger, Larry L., to Coleman Company, Inc., The. Camper for pick-up truck. 255,027, 5-20-80, Cl. D12-156.000.

Hihara, Yukiyoshi, to Yasui Sangyo Co., Ltd. Wheel balancer. 255,015, 5-20-80, Cl. D10-82.000.

Hill, James A.; Gerlinger, Edward B.; Leith, Robert H.; and Navia, Jaime A. Test and measurement instrument for analyzing digital signals. 255,014, 5-20-80, Cl. D10-75.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,016, 5-20-80, Cl. D11-3.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,017, 5-20-80, Cl. D11-3.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,018, 5-20-80, Cl. D11-3.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,019, 5-20-80, Cl. D11-3.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,020, 5-20-80, Cl. D11-3.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,021, 5-20-80, Cl. D11-3.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,022, 5-20-80, Cl. D11-3.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,023, 5-20-80, Cl. D11-15.000.

Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Housing for a magnetic contact switch. 255,030, 5-20-80, Cl. D13-32.000.

Horwitz, Rudy J. Psychological test machine. 255,036, 5-20-80, Cl. D19-60.000.

Howmedica, Inc.: *See—*
Miller, Joseph E., 255,048, Cl. D24-26.000.

Huckins, Charles M.: *See—*
Holce, Thomas J.; and Huckins, Charles M., 255,030, Cl. D13-32.000.

Iinuma, Kanji, to Daiwa Seiko, Inc. Fishing reel. 255,042, 5-20-80, Cl. D22-25.000.

Itakura, Hitoshi, to Tomy Kogyo Co., Inc. Housing for use with manipulative games. 255,038, 5-20-80, Cl. D21-15.000.

J & J Wacker Inc.: *See—*
Wacker, Jacob; and Wacker, Joanne, 255,050, Cl. D27-16.000.

Keithley, Gary R.: *See—*
O'Brien, John F.; and Keithley, Gary R., 255,013, Cl. D10-60.000.

Ketcham & McDougall, Inc.: *See—*
Grunstad, Jerome A., 255,037, Cl. D19-92.000.
Macowski, William, 255,051, Cl. D27-29.000.

Kingsford, Ted I., to Plough, Inc. Combined lipstick and magnifying casing therefor. 255,054, 5-20-80, Cl. D28-89.000.

Kronsbein, Dirk G., to Ultrafilter GmbH. Filter casing. 255,045, 5-20-80, Cl. D23-4.000.

Lapetina, John B. Fishing lure. 255,043, 5-20-80, Cl. D22-27.000.

Lazzara, Anthony R., to Scientific Technology, Inc. Housing for photoelectric sensor and control circuit responsive thereto. 255,031, 5-20-80, Cl. D13-99.000.

Leer, Inc.: *See—*
Collins, John, 255,028, Cl. D12-196.000.

Leith, Robert H.: *See—*
Hill, James A.; Gerlinger, Edward B.; Leith, Robert H.; and Navia, Jaime A., 255,014, Cl. D10-75.000.

Lonnstedt, Bo G. Support for an ear protector. 254,996, 5-20-80, Cl. D2-233.000.

Macowski, William, to Ketcham & McDougall, Inc. Ash tray. 255,051, 5-20-80, Cl. D27-29.000.

Maddock, Peter L., to Telefonaktiebolaget L M Ericsson. Control unit for paging system. 255,032, 5-20-80, Cl. D14-92.000.

Magic Touch Manufacturing Corp.: *See—*
O'Brien, John F.; and Keithley, Gary R., 255,013, Cl. D10-60.000.

Matusiak, Gerald W.: *See—*
Matusiak, Stephen H.; and Matusiak, Gerald W., 255,009, Cl. D7-136.000.

Matusiak, Stephen H.; and Matusiak, Gerald W., to Almatic Industries Limited. Burner. 255,009, 5-20-80, Cl. D7-136.000.

Meister, Michael L.; Fee, Robert W.; and Robbins, Richard J., to A-T-O Inc. Body for an aerial lift platform. 255,024, 5-20-80, Cl. D12-61.000.

Miller, Joseph E., to Howmedica, Inc. Intramedullary brush. 255,048, 5-20-80, Cl. D24-26.000.

Miyamura, Nobuhiro: *See—*
Takigawa, Hiroyoshi; and Miyamura, Nobuhiro, 255,025, Cl. D12-143.000.

Moers, William O., to Tenderfoot International, Inc. Building. 255,049, 5-20-80, Cl. D25-22.000.

Morrison, Thurber H.: *See—*
Boldt, Melvin H.; Morrison, Thurber H.; and Becker, Robert W., 255,008, Cl. D7-132.000.

Muehl, Lawrence L., to Dakota Cateye, Inc. Fishing signal device. 255,041, 5-20-80, Cl. D22-23.000.

Muller, Arthur W.; and Hassle, Max A., to Airwick Industries, Inc. Dispenser for air-treating material. 255,047, 5-20-80, Cl. D23-150.000.

National Presto Industries, Inc.: *See—*
Boldt, Melvin H.; Morrison, Thurber H.; and Becker, Robert W., 255,008, Cl. D7-132.000.

Navia, Jaime A.: *See—*
Hill, James A.; Gerlinger, Edward B.; Leith, Robert H.; and Navia, Jaime A., 255,014, Cl. D10-75.000.

North, Roger W. Drum. 255,035, 5-20-80, Cl. D17-22.000.

O'Brien, John F.; and Keithley, Gary R., to Magic Touch Manufacturing Corp. Thermometer support base. 255,013, 5-20-80, Cl. D10-60.000.

Olinkraft, Inc.: *See—*
Cooper, Leonard M.; and Adreon, Gary L., 255,011, Cl. D9-245.000.

Ostrowsky, Efrem M., to Ethyl Products Company. Dispenser cap for a pressurized container. 255,012, 5-20-80, Cl. D09-258.000.

Otero, Domingo V. Combined shelf and drawer unit. 255,002, 5-20-80, Cl. D6-129.000.

Pallotta, George A., Jr. Knife holding board. 255,006, 5-20-80, Cl. D7-74.000.

Pallotta, George A., Jr. Knife holding board. 255,007, 5-20-80, Cl. D7-74.000.

Payer-Lux Eduard Payer: *See—*
Schade, Hans-Ulrich, 255,053, Cl. D28-49.000.

Peets, Robert S.: *See—*
Genaro, Donald M.; Felix, Cristian J.; Tilley, Alvin R.; and Peets, Robert S., 255,003, Cl. D6-167.000.

Peron, Jean-Claude, to Compagnie Generale des Etablissements Michelin. Tire. 255,026, 5-20-80, Cl. D12-147.000.

Plough, Inc.: *See—*
Kingsford, Ted I., 255,054, Cl. D28-89.000.

Quitman, Yolanda. Cabinet. 255,001, 5-20-80, Cl. D6-104.000.

Robbins, Richard J.: *See—*
Meister, Michael L.; Fee, Robert W.; and Robbins, Richard J., 255,024, Cl. D12-61.000.

S. T. Dupont: *See—*
Dinh Van, Jean, 255,046, Cl. D27-36.000.

Schade, Hans-Ulrich, to Payer-Lux Eduard Payer. Shaver. 255,053, 5-20-80, Cl. D28-49.000.

Scientific Technology, Inc.: *See—*
Lazzara, Anthony R., 255,031, Cl. D13-99.000.

Sentrol, Inc.: *See—*
Holce, Thomas J.; and Huckins, Charles M., 255,030, Cl. D13-32.000.

Shelly & Anderson Furniture Mfg. Co., Inc.: *See—*
Dybal, Walter F., 255,000, Cl. D6-63.000.

Singer Company, The: *See—*
Genaro, Donald M.; Felix, Cristian J.; Tilley, Alvin R.; and Peets, Robert S., 255,003, Cl. D6-167.000.

Takigawa, Hiroyoshi; and Miyamura, Nobuhiro, to Bridgestone Tire Company, Limited. Vehicle tire. 255,025, 5-20-80, Cl. D12-143.000.

Telefonaktiebolaget L M Ericsson: *See—*
Maddock, Peter L., 255,032, Cl. D14-92.000.

Tenderfoot International, Inc.: *See—*
Moers, William O., 255,049, Cl. D25-22.000.

Thorpe, Robert K., to Charlton Company, The. Table base. 255,004, 5-20-80, Cl. D6-196.000.

Tilley, Alvin R.: *See*—
Genaro, Donald M.; Felix, Cristian J.; Tilley, Alvin R.; and Peets, Robert S., 255,003, Cl. D6-167.000.

Tomy Kogyo Co., Inc.: *See*—
Itakura, Hitoshi, 255,038, Cl. D21-15.000.

Ultrafilter GmbH: *See*—
Kronsbein, Dirk G., 255,045, Cl. D23-4.000.

Van Wyck International Corporation: *See*—
Fuchs, Nathan, 255,005, Cl. D7-49.000.

Wacker, Jacob; and Wacker, Joanne, to J & J Wacker Inc. Smoker's station. 255,050, 5-20-80, Cl. D27-16.000.

Wacker, Joanne: *See*—
Wacker, Jacob; and Wacker, Joanne, 255,050, Cl. D27-16.000.

Welch Allyn, Inc.: *See*—
Brownlie, Alan W., 255,029, Cl. D13-6.000.

Welsch, Walter N.; and Fleckenstein, Elwin H., to Dynabrade, Inc. Machine housing for belt-type surface finishing tool. 255,034, 5-20-80, Cl. D15-126.000.

Wilstac Inc.: *See*—
Espeseth, Donald O., 254,998, Cl. D6-27.000.

Yasui Sangyo Co., Ltd.: *See*—
Hihara, Yukiyoshi, 255,015, Cl. D10-82.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 20, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

322 4,203,167

CLASS 3

13 4,203,168

CLASS 4

144.1 4,203,169
146 4,203,171
172 4,203,170
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231 4,203,172
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CLASS 5

503 4,203,175

CLASS 8

115.5 4,203,723
467 4,203,722

CLASS 13

9 R 4,204,082

CLASS 16

24 4,203,177

CLASS 17

50 4,203,178
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CLASS 23

230 B 4,203,724
230 HC 4,203,725
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CLASS 24

17 B 4,203,180
230 A 4,203,181
263 D 4,203,182

CLASS 29

33 A 4,203,183
149.5 DP 4,203,184
157.3 C 4,203,185
157.3 R 4,203,186
283.5 4,203,187
420 4,203,188
432 4,203,189
451 4,203,190
4,203,191
452 4,203,192
505 4,203,195
526 R 4,203,193
566.3 4,203,196
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611 4,203,197
4,203,198
612 4,203,199
623 4,203,200
623.1 4,202,201
623.2 4,203,202
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727 4,203,205
731 4,203,206
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CLASS 30

155 4,203,208
164.95 4,203,209
172 4,203,210
272 R 4,203,211
276 4,203,212
343 4,203,213
355 4,203,214
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CLASS 32

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CLASS 33

149 R 4,203,224
174 L 4,203,225
185 V 4,203,226
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CLASS 34

10 4,203,228
46 4,203,229
99 4,203,230

CLASS 35

20 4,203,231
25 4,203,232
29 R 4,203,233
76 4,203,234

CLASS 36

118 4,203,235
123 4,203,236

CLASS 37

43 E 4,203,237
118 R 4,203,238

CLASS 40

152.1 4,203,239
310 4,203,240
406 4,203,241
610 4,203,242

CLASS 42

73 4,203,243
4,203,244

CLASS 43

25.2 4,203,245
42.31 4,203,246

CLASS 44

1 SR 4,203,727
51 4,203,728
4,203,729
71 4,203,730

CLASS 46

1 K 4,203,247
22 4,203,248
74 D 4,203,249
79 4,203,250
107 4,203,251
178 4,203,252

CLASS 47

10 4,203,253
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CLASS 48

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CLASS 49

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CLASS 51

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95 GH 4,203,258
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123 G 4,203,260
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204 4,203,262
293 4,203,732
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CLASS 52

1 4,203,264
81 4,203,265
116 4,203,266
148 4,203,267
630 4,203,268

CLASS 53

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133 4,203,270
250 4,203,271
374 4,203,272
399 4,203,273
537 4,203,274

CLASS 55

26 4,203,734
4,203,735
96 4,203,736
287 4,203,737
4,203,738
323 4,203,739

CLASS 56

15.8 4,203,275
202 4,203,276
377 4,203,277

CLASS 60

39.36 4,203,283
245 4,203,284
261 4,203,285
266 4,203,286
329 4,203,287
345 4,203,288
358 4,203,289
420 4,203,290
433 4,203,291
445 4,203,292
490 4,203,293
497 4,203,294
531 4,203,295
602 4,203,296
660 4,203,297

CLASS 62

2 4,203,298
18 4,203,740
24 4,203,741
4,203,742
49 4,203,299
52 4,203,300
115 Re.30,275
131 4,203,301
259 4,203,302

CLASS 64

12 4,203,303
13 4,203,304
15 R 4,203,305
23 4,203,306

CLASS 65

3 A 4,203,743
4,203,744
6 4,203,745
4,203,746
4,203,747
14 4,203,748
68 4,203,749
99 A 4,203,750
106 4,203,751
163 4,203,752
4,203,753
273 4,203,754

CLASS 68

17 R 4,203,307

CLASS 71

9 4,203,755
86 4,203,756
87 4,203,757
100 4,203,758

CLASS 72

34 4,203,308
96 4,203,309
247 4,203,310
254 4,203,311
299 4,203,312
364 4,203,313
427 4,203,314

CLASS 73

1 R 4,203,315
3 4,203,316
38 4,203,317
141 A 4,203,318
4,203,319
150 R 4,203,320
168 4,203,321
194 A 4,203,322
194 E 4,203,323
290 V 4,203,324
304 R 4,203,325
339 R 4,203,326
721 4,203,327

CLASS 74

25 4,203,328
89.2 4,203,329
335 4,203,375
527 4,203,330
606 R 4,203,331

CLASS 75

0.5 BA 4,203,759
12 4,203,760
40 4,203,761
68 R 4,203,762
129 4,203,763

CLASS 81

3 R 4,203,332
9.5 A 4,203,333

CLASS 83

23 4,203,334
232 4,203,335
550 4,203,336

CLASS 84

1.01 4,203,337
1.14 4,203,338
1.19 4,203,339
1.26 4,203,340
255 4,203,341
293 4,203,342
415 4,203,343
470 R 4,203,344
478 4,203,345

CLASS 85

70 4,203,346

CLASS 89

1.816 4,203,347
148 4,203,348

CLASS 91

47 4,203,349
235 4,203,350

CLASS 92

69 R 4,203,351
94 4,203,352
159 4,203,353
169 4,203,354

CLASS 93

58 R 4,203,355

CLASS 98

66 R 4,203,356

CLASS 99

340 4,203,357
352 4,203,358

CLASS 100

209 4,203,359

CLASS 101

129 4,203,360
177 4,203,361
327 4,203,362
409 4,203,363

CLASS 102

38 WR 4,203,364
214 4,203,365
4,203,366

CLASS 104

7 B 4,203,367
92 4,203,368
130 4,203,369
162 4,203,370

CLASS 105

225 4,203,371

CLASS 106

38.35 4,203,771
40 R 4,203,772
4,203,773
50 4,203,774
238 4,203,776

CLASS 108

152 4,203,373

CLASS 110

258 4,203,374
346 4,203,376

CLASS 112

58 4,203,377
158 E 4,203,378

CLASS 113

120 B 4,203,379

CLASS 114

144 R 4,203,380
274 4,203,381

CLASS 116

28 R 4,203,382
95 4,203,383
267 4,203,384
270 4,203,385

CLASS 118

653 4,203,386
715 4,203,387

CLASS 119

1 4,203,388
3 4,203,389
29 4,203,390

CLASS 122

4 D 4,203,391
17 4,203,392

CLASS 123

30 D 4,203,393
32 EA 4,203,395
32 EE 4,203,394
58 B 4,203,396
90.16 4,203,397
119 A 4,203,399
4,203,400
119 EC 4,203,398
127 4,203,411
136 4,203,401
139 AW 4,203,402
148 AC 4,203,403
148 ND 4,203,404
187.5 R 4,203,405
197 A 4,203,406
198 DC 4,203,408
198 E 4,203,407
4,203,409
205 4,203,410

CLASS 124

23 R 4,203,412
78 4,203,413

CLASS 125

23 C 4,203,414

CLASS 126

110 R 4,203,415
165 4,203,417
212 4,203,416
263 4,203,418
271.1 4,203,423
417 4,203,422
422 4,203,424
425 4,203,426
426 4,203,420
4,203,425
430 4,203,419
444 4,203,421
449 4,203,428
451 4,203,427

CLASS 128

1 R 4,203,429
4 4,203,430
39 4,203,431
79 4,203,432
80 A 4,203,433
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205.24 4,203,434
214 R 4,203,436
229 4,203,437
254 4,203,438
260 4,203,439
4,203,440
4,203,441
4,203,442
272.3 4,203,443
276 4,203,444
283 4,203,445
329 R 4,203,446
419 PG 4,203,447
4,203,448
473 4,203,449
630 4,203,450
672 4,203,451
732 4,203,452

CLASS 131

20 R 4,203,453
170 R 4,203,454
173 4,203,455
230 4,203,456

CLASS 134

7 4,203,777
4,203,778

CLASS 135

5 C 4,203,457

CLASS 136

233 4,203,779

CLASS 137

38 4,203,458
119 4,203,459
240 4,203,460
343 4,203,461
393 4,203,462
403 4,203,463
454.2 4,203,464
487.5 4,203,465
543 4,203,466
557 4,203,467
624.11 4,203,468
625.43 4,203,469
625.46 4,203,470
637 4,203,471
828 4,203,472

CLASS 138

93 4,203,473
96 R 4,203,474
109 4,203,475
122 4,203,476

CLASS 140

105 4,203,477

CLASS 141

206 4,203,478

CLASS 148

1.5 4,203,780
4,203,781
12 E 4,203,782
12.4 4,203,783
111 4,203,784
171 4,203,785

CLASS 149

19.91 4,203,786
35 4,203,787

CLASS 150

3 4,203,479

CLASS 152

209 NT 4,203,480
330 RF 4,203,481

CLASS 156

44 4,203,788
59 4,203,789
179 4,203,790
252 4,203,791
272 4,203,792
394 4,203,793
415 4,203,794
446 4,203,795
504 4,203,796
521 4,203,797
567 4,203,798
601 4,203,799
643 4,203,800

CLASS 164

12 4,203,482
116 4,203,483
227 4,203,484

CLASS 165

2 4,203,485
48 R 4,203,486
50 4,203,487
80 B 4,203,488
104 S 4,203,489
134 R 4,203,490

CLASS 166

274 4,203,491
300 4,203,492

CLASS 171

16 4,203,493

CLASS 172

166 4,203,494
370 4,203,495

CLASS 174

9 F	4,204,083
25 G	4,204,084
86	4,204,085
102 R	4,204,086
120 SR	4,204,087

CLASS 175

329	4,203,496

CLASS 177

134	4,203,497

CLASS 178

22	4,204,088
30	4,204,089
	4,204,090

CLASS 179

1 G	4,204,092
1 GB	4,204,091
18 FA	4,204,094
98	4,204,095
146 R	4,204,096
189 D	4,204,097

CLASS 180

70 MS	4,203,498
89.12	4,203,499
219	4,203,500

CLASS 181

120	4,203,501
238	4,203,502
272	4,203,503

CLASS 182

10	4,203,504

CLASS 187

29 R	4,203,506
81.7	4,203,505

CLASS 188

317	4,203,507
325	4,203,508

CLASS 193

37	4,203,509

CLASS 198

437	4,203,510
458	4,203,511
594	4,203,512
620	4,203,513
774	4,203,514

CLASS 200

1 R	4,204,098
4	4,204,099
52 R	4,204,100
144 AP	4,204,101
153 J	4,204,102
153 SC	4,204,103
164 R	4,204,104

CLASS 201

40	4,203,803

CLASS 202

121	4,203,804
176	4,203,805
	4,203,806

CLASS 204

1 T	4,203,807
23	4,203,808
32 R	4,203,809
38 B	4,203,810
78	4,203,811
94	4,203,812
103	4,203,813
129	4,203,814
159.16	4,203,816
159.2	4,203,815
180 R	4,203,817
212	4,203,818
247	4,203,819
263	4,203,820
268	4,203,821
301	4,203,822

CLASS 206

63.5	4,203,515
216	4,203,516
221	4,203,517
380	4,203,518
387	4,203,519
439	4,203,520
525	4,203,521

CLASS 208

10	4,203,823
33	4,203,824
48 R	4,203,825
64	4,203,826
206	4,203,827
213	4,203,828
216 R	4,203,829
236	4,203,830

CLASS 209

13	4,203,831
44	4,203,832
139 R	4,203,833
211	4,203,834
558	4,203,522

CLASS 210

33	4,203,835
42 R	4,203,836
44	4,203,837
63 R	4,203,838
71	4,203,839
83	4,203,840
205	4,203,841
242 S	4,203,842
262	4,203,843
321 B	4,203,844
386	4,203,845
486	4,203,846
490	4,203,847
	4,203,848
522	4,203,849

CLASS 213

100 W	4,203,523

CLASS 215

216	4,203,524

CLASS 219

10.55 E	4,204,105
213	4,204,106
216	4,204,107
265	4,204,108
	4,204,109
313	4,204,110
411	4,204,111

CLASS 220

4 C	4,203,525
71	4,203,526
253	4,203,527
269	4,203,528
337	4,203,529

CLASS 221

186	4,203,530

CLASS 222

153	4,203,532
241	4,203,533
402.13	4,203,534
411	4,203,535
495	4,203,536
570	4,203,537
603	4,203,538

CLASS 225

2	4,203,539

CLASS 226

119	4,203,540

CLASS 227

40	4,203,541

CLASS 228

1 A	4,203,531

CLASS 233

26	Re.30,276

CLASS 235

85 R	4,203,542
95 R	4,204,112
375	4,204,113
449	4,203,544

CLASS 236

93 A	4,203,545

CLASS 238

1	4,203,546
8	4,203,547
10 F	4,203,548
111	4,203,549

CLASS 239

102	4,203,550
195	4,203,551
337	4,203,552
420	4,203,553
585	4,203,554

CLASS 241

15	4,203,555
86.1	4,203,556
186 R	4,203,557
247	4,203,558

CLASS 242

18 G	4,203,559
45	4,203,560
47	4,203,561
55.3	4,203,562
66	4,203,563
71.8	4,203,564
84.1 R	4,203,565

CLASS 244

3.23	4,203,569
57	4,203,566

CLASS 248

108	4,203,567
309 R	4,203,568

CLASS 250

227	4,204,115
229	4,204,116
287	4,204,117
315.2	4,204,118
337	4,204,119
341	4,204,120
343	4,204,121
347	4,204,122
363 S	4,204,123
445 T	4,204,124
486	4,204,125

CLASS 251

14	4,203,570
31	4,203,571
95	4,203,572
133	4,203,573
139	4,203,574

CLASS 252

8.05	4,203,850
8.55 D	4,203,853
8.6	4,203,851
8.8	4,203,852
25	4,203,854
42.7	4,203,855
54.6	4,203,856
92	4,203,857
135	4,203,858
174.23	4,203,859
181.2	4,203,860
182.1	4,203,861
299	4,203,862
301.1 W	4,203,863
314	4,203,864
429 B	4,203,867
429 C	4,203,866
429 R	4,203,865
439	4,203,868
455 Z	4,203,869
459	4,203,870
518	4,203,871
542	4,203,872
545	4,203,873

CLASS 254

88	4,203,575
89 R	4,203,576
100	4,203,577
109	4,203,578

CLASS 260

3	4,203,874
13	4,203,875
17.4 R	4,203,876
18 EP	4,203,878
18 R	4,203,877
23 XA	4,203,879
	4,203,880
28.5 A	4,203,881
	4,203,882
29.2 TN	4,203,883
33.6 AQ	4,203,884
37 SB	4,203,886
40 R	4,203,887
45.7 P	4,203,888
45.8 N	4,203,890
45.8 NT	4,203,889
112 B	4,203,891
112 R	4,203,892
121	4,203,893
156	4,203,894
239 A	4,203,896
239 E	4,203,895
239.1	4,203,897
243.3	4,204,061
244.4	4,203,898
326.31	4,203,902
326.5 S	4,203,901
340.3	4,203,903
343.6	4,203,904
346.11	4,203,907
	4,203,908
346.3	4,203,905
346.4	4,203,906
347.2	4,203,909
348.29	4,203,910
369	4,203,885
405.6	4,203,911
429 R	4,203,912
449.5	4,203,915
453 P	4,203,916
465 B	4,203,917
465 D	4,203,918
	4,203,919
543 P	Re.30,279
553 A	4,203,920
	4,203,921
570 R	4,203,922
586 P	4,203,923
648 D	4,203,929
923	4,203,932
990	4,203,933

CLASS 261

98	4,203,934
	4,203,935

CLASS 264

26	4,203,936
101	4,203,937
127	4,203,938
130	4,203,939
154	4,203,940
250	4,203,941
559	4,203,942

CLASS 266

117	4,203,579
216	4,203,580
217	4,203,581

CLASS 269

32	4,203,582
234	4,203,583

CLASS 270

40	4,203,584

CLASS 271

4	4,203,585
34	4,203,586
246	4,203,588
258	4,203,589
265	4,203,590
293	4,203,587

CLASS 272

67	4,203,591
117	4,203,593

CLASS 273

25	4,203,595
73 E	4,203,597
73 J	4,203,596
77 A	4,203,598
84 R	4,203,599
121 A	4,203,602
129 W	4,203,603
176 FB	4,203,604
247	4,203,605
336	4,203,592
407	4,203,600
411	4,203,594
421	4,203,601

CLASS 274

23 R	4,203,606

CLASS 277

188 A	4,203,607
235 B	4,203,608

CLASS 280

47.11	4,203,609
87.04 R	4,203,610
163	4,203,611
287	4,203,612
460 A	4,203,613
637	4,203,614
689	4,203,615
737	4,203,616
797	4,203,617
804	4,203,618

CLASS 282

27.5	4,203,619

CLASS 283

23	4,203,620

CLASS 290

1 R	Re.30,280
55	4,204,126

CLASS 292

216	4,203,621
221	4,203,622

CLASS 296

178	4,203,623

CLASS 297

162	4,203,624

CLASS 299

6	4,203,625
33	4,203,626

CLASS 303

6 C	4,203,627
	4,203,628
10	4,203,629
24 C	4,203,630
52	4,203,631
100	4,203,632

CLASS 305

28	4,203,633

CLASS 307

39	4,204,127
141	4,204,128
147	4,204,129
215	4,204,130
251	4,204,131
309	4,204,132
310	4,204,133

CLASS 308

187.2	4,203,634
213	4,203,635

CLASS 310

52	4,204,134
357	4,204,135

CLASS 312

7 TV	4,203,636

CLASS 313

473	4,204,136
491	4,204,137

CLASS 315

39.51	4,204,138
58	4,204,139
241 P	4,204,140
311	4,204,141

CLASS 318

257	4,204,142
341	4,204,143
568	4,204,144
	4,204,145
640	4,204,146

CLASS 323

4	4,204,147
22 SC	4,204,148
24	4,204,149
102	4,204,150
119	4,204,151

CLASS 324

51	4,204,154
158 F	4,204,155
158 MG	4,204,156
166	4,204,157
208	4,204,158
232	4,204,159
236	4,204,160
390	4,204,152
426	4,204,161
429	4,204,153
430	4,204,162

CLASS 328

165	4,204,170
167	4,204,171

CLASS 330

134	4,204,172

CLASS 331

1 A	4,204,173
10	4,204,174
94.5 D	4,204,175

CLASS 333

28 R	4,204,176
166	4,204,177
194	4,204,178

CLASS 334

7	4,204,179

CLASS 335

205	4,204,180

CLASS 336

96	4,204,181

CLASS 337

244	4,204,182
295	4,204,183
	4,204,184

CLASS 338

4	4,204,185
30	4,204,186
307	4,204,187

CLASS 339

5 R	4,203,637
14 P	4,203,638
22 R	4,203,639
41	4,203,640
74 R	Re.30,277
75 MP	4,203,642
75 P	4,203,641
107	4,203,643
128	4,203,644
147 R	4,203,645
205	4,203,646
256 R	4,203,647
275 T	4,203,648

CLASS 340

7 R	4,204,188
40	4,204,189
52 A	4,204,190
134	4,204,191
146.3 H	4,204,193
147 SY	4,204,194
151	4,204,195
309.4	4,204,196
347 AD	4,204,198
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347 NT	4,204,197
384 E	4,204,200
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571	4,204,202
620	4,204,203
712	4,204,204
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745	4,204,208
758	4,204,209

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100 LE	4,204,211
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446	4,203,673

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DESIGN PATENTS

6 : 255,033
06 : 254,998
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17 : 255,008
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18 : 254,999
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20 : 255,024
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25 : 255,044
27 : 255,037
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29 : 254,997
34 : 255,003
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36 : 255,001
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39 : 255,013
41 : 255,014
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255,035
42 : 255,027
255,036

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45 : 255,026
46 : 255,041
47 : 255,054
49 : 255,006
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51 : 255,043

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06 : 4,537

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